Dumps Upon Dumps – DuPont East Chicago Facility: East Chicago, Indiana

DuPont's own initial investigations of its East Chicago Facility in East Chicago, Indiana detail 90 sites of chemical waste activity, spills, and/or land & water disposal and discharge. The list comprises 47 Solid Waste Management Units (SWMU) and 43 Areas Of Concern (AOC)…

Much of the waste disposed of and some of the products manufactured at DuPont's East Chicago Facility in East Chicago, Indiana are legally Listed or Characteristic Hazardous. Hazardous waste regulation began under the 1976 Resource Conservation and Recovery Act (RCRA).

At the DuPont East Chicago Facility in East Chicago, Indiana numerous land & water waste disposal sites are literally built on top of one another…

No state or federal laws or regulations allow or permit Hazardous Waste land disposal of Toxic & Hazardous Wastes in the manner as historically documented at DuPont's East Chicago Facility in East Chicago, Indiana.

To illustrate this point the following is excerpted from DuPont's Draft Phase I RFI Work Plan dated March 9, 1998 concerning the current conglomeration of SWMUs and AOCs at the DuPont East Chicago Facility in East Chicago, Indiana…

"SWMU 1B is overlain by SWMUs 1C, 1D, 1E, 1G, 1H, and 1L and may be collocated with SWMU 1F and part of SWMU 1A."

"SWMU 1C overlaps SWMU 1B, is co-located with SWMUs 1F, 1G, and 1H, and is partially covered by SWMUs 1D and 1L."

"SWMU 1D was constructed over several other SWMUs, namely SWMUs 1B, 1C, 1F, and 1G."

"SWMU 1E was constructed on top of SWMU 1B."

"SWMU 1F is co-located with SWMUs 1B and 1C and beneath SWMU 1D."

<u>Dumps Upon Dumps – DuPont East Chicago Facility: East Chicago, Indiana</u>

"SWMU 1G appears to be co-located with SWMU 1C and is beneath SWMUs 1D and 1L."

"SWMU 1H is co-located with SWMU 1C."

SWMU 1I is a "disposal area within SWMU 1A"

SWMU 1J is a "disposal area within SWMU 1A"

SWMU 1K is a "disposal area within SWMU 1A"

SWMU 1L is "...constructed upon SWMUs 1B, 1C, and 1G."

SWMU 4 "...is co-located with parts of AOCs 2E and 3J."

SWMU 8 overlaps AOCs 2B and 3E

SWMU 20 includes part of AOC 11.

SWMU 21 is co-located with part of AOC 5.

AOC 4 is adjacent to the northern end of the SWMU 14.

AOC 5 is co-located with AOCs 3H and 1C and part of SWMU 21.

AOC 7A is co-located with AOC 6, and AOC 7B is co-located with AOC 3E.

The southern part of AOC 11 was covered by SWMU 20 when the Grand Calumet channel was relocated in the late 1950s.

Ok Got That? Easy to grasp the situation right?

It actually is easy to understand the true situation at DuPont's East Chicago Facility in East Chicago, Indiana... It's a grossly contaminated 270 acre Toxic and Hazardous chemical manufacturing facility that operated over a century and has a multitude of Toxic and Hazardous waste disposal sites that actually are Toxic Dumps Upon Dumps in some cases! And it does not belong anywhere near a residential neighborhood.

– Potential Regulatory Points of Compliance for DuPont – Chemours, USS Lead, and other "Responsible Parties" –

DowDuPont – Chemours, USS Lead, and other "Responsible Parties" that have contaminated the Air, Land, and Waters of East Chicago and Northwest Indiana have failed to be regulated under numerous federal, state, and/or local laws and regulations designed to prevent the spread of Hazardous & Toxic substances for decades...

Precipitation (rain, snow) falling onto the site causes runoff and infiltration of water. The water that is runoff can directly transport contaminated soils and leachate offsite.

The infiltrating water percolates down though the layers of sand and waste and leaks out as a brew of contaminated water that is called Leachate. This contaminated water migrates out the sides and bottom of the waste disposal sites and easily migrates through the Calumet Sand Aquifer.

The largely Quartz sand aquifer is 40% permeable and Quartz does not provide much buffering capacity to help mitigate the spread of acres and acres of Hazardous & Toxic waste seeping through the sand into surface and ground water of the surrounding area...

The DuPont Site is potentially subject to the following regulatory schemes:

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This would be administered under a National Pollution Discharge Elimination System (NPDES) Permit and potentially include:

the existing? storm water discharge permit;

thousands of feet of abandoned process and sanitary sewers;

leachate and contaminated groundwater seeps – onsite and offsite;

contaminated groundwater discharging to residents basements and sump pumps, the Grand Calumet River, and/or Lake Michigan.

"...courts that have found the CWA applicable where "pollutants travel from a point source to navigable waters through hydrologically connected groundwater." Among these cases is *Hawai'i Wildlife Fund v. Cty. of Maui*, a recent decision from the District of Hawai'i. The court also deemed persuasive the reasoning of the Northern District of California in another recent case:

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Sierra Club v. Virginia Elec. & Power Co., out of the Eastern District of Virginia, presents similar facts and reaches a similar result."

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Pollutant: includes, but is not necessarily limited to: dredged spoil, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, solid wastes, toxic wastes, hazardous substances, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and other industrial, municipal, and agricultural waste discharged into water.

Waters of the State: such accumulations of water, surface and underground, natural and artificial, public and private, or parts thereof, which are wholly or partially within, flow through, or border upon this state. The term does not include any private pond, any off-stream pond, reservoir, or facility built for reduction or control of pollution or cooling of water prior to discharge unless the discharge therefrom causes, or threatens to cause water pollution.

If a facility discharges pollutants from any point source into waters of the state of Indiana, then the operator of that facility must apply for a NPDES permit from the Indiana Department of Environmental Management (IDEM). The Industrial Permits Section issues permits covering discharges from all industries."

See: [http://www.in.gov/idem/stormwater/] 'Storm Water Regulations, Permitting, And Resource Information' IDEM

See: [https://in.gov/idem/cleanwater/2434.htm] and [https://in.gov/idem/cleanwater/2439.htm] 'Industrial Wastewater Permits – Industrial Permit Overview' IDEM

The Safe Drinking Water Act (SDWA) and Underground Injection Control (UIC) Program

The use of Permeable Reactive Barriers, Bio-Wall Trenches, and Injections of substances into the Calumet Sand Aquifer all fit the U.S. EPA's definition of a Class V Injection Well.

"At the federal level, Aquifer Remediation Wells (ARWs) are subject to the federal UIC standards, and, as indicated, may be additionally regulated under CERCLA Cleanups, RCRA Corrective Actions, and the UST Program."

"According to available UIC guidance on this matter, each of the vertical pipes in such a system, individually or in a series, should be considered an injection well subject to UIC authorities."

"Innovative technologies that typically involve well injection include:

In situ bioremediation;

in situ oxidation;

in situ flushing;

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permeable active barrier systems."

Emergency Planning and Community Right-to-Know Act (EPCRA) and Toxics Release Inventory (TRI) Program

EPCRA requires a facility to immediately notify the local emergency planning committee ("LEPC") and state emergency response commission ("SERC") if there is a release (other than a federally permitted release) from the facility of:

a CERCLA hazardous substance that exceeds its Reportable Quantity (RQ), or

an Extremely Hazardous Substance ("EHS") that exceeds its RQ.

EPA has established or proposed adjustments to the RQs for all of the roughly 800 Superfund substances... And certainly the RQs have been exceeded for the massive amounts of "unusual incidents" spills, leaks, and disposal of wastes that has been and is currently ongoing at the DuPont Site.

See: [https://www.ecfr.gov/cgi-bin/text-idx?SID=5eb9206a60662143cb26a1b0a7263e74&mc=true&node=se40.28.302_14&rgn=div8] 'Title 40: Protection of Environment, PART 302—DESIGNATION, REPORTABLE QUANTITIES, AND NOTIFICATION'

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Underground injection of toxics is considered a release and must be reported under the TRI."

"In addition, UIC regulations require that EPA consider numerous Federal laws when issuing UIC permits, including Section 7 of the Wild and Scenic Rivers Act, Section 106 of the National Historic Preservation Act, **Section 7 of the Endangered Species Act, Section 307(c) the Coastal Zone Management Act, and the Fish and Wildlife Coordination Act.** These laws are considered to insure that injection operations do not adversely affect other important nearby resources and sensitive areas."

"Injection wells can threaten USDWs in three ways: internal failure, external failure, and injection directly into a USDW. Protecting USDWs from contamination through these pathways is the basic premise of the UIC program."

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See: [https://www.epa.gov/uic/basic-information-about-class-v-injection-wells] 'Basic Information About Class V Injection Wells' U.S. EPA

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Cross Connection Control and Backflow Prevention

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"(2) "Backflow" means the flow of water or contaminants into the public water supply distribution system from a source other than the public water supply."

"(5) "Cross connection" means any physical arrangement, including cross connection control devices not in working order, whereby a public water supply distribution system is directly connected, either continuously or intermittently, with any secondary source of supply, sewer, drain, conduit, pool, piping, storage reservoir, plumbing fixture, or other device which contains, or may contain, and is capable of imparting to the public water supply, contaminants, contaminated water, sewage, or other waste or liquid of unknown or unsafe quality"

Waste derived from the treatment, storage, or disposal of listed hazardous wastes include wastes such as sludge's, ash, spill residues, and leachate generated from treatment, storage, or disposal of listed hazardous waste.

See: [http://epa.ohio.gov/portals/32/pdf/MixtureDerivedFromRule.pdf]

"Section 3005 of RCRA prohibits the operation of hazardous waste treatment, storage, or disposal facilities without a permit. EPA interprets the term "disposal" for purposes of RCRA Subtitle C regulation to have the same meaning as the term "land disposal" as defined under section RCRA 3004(k).

Therefore, conducting any of the activities that constitute "land disposal" of hazardous waste will subject the unit to Subtitle C permitting and land disposal restrictions. "Land disposal" occurs when hazardous wastes are placed into a unit, including when hazardous wastes from different units are consolidated into one unit, or removed and treated outside a unit and redeposited, or treated within the unit in an incinerator, impoundment, or tank and then redeposited." – 'clarification of the Agency's interpretation of "active management"' United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C., (9484.1994(01)), April 6, 1994

"However, if the reactive media is installed by a high-pressure jetting technique or by vertical hydraulic fracturing, a permit may, in some circumstances, be required. The need for a permit under these conditions will be a state-by-state determination.

If USEPA has not delegated the UIC program to the state, the regional USEPA office makes the determination. A review of the pertinent regulations should project. w th be conducted during initial design stages of the project."

"However, contaminated soil, groundwater, or reactive material that is brought to the surface, such as during PRB construction or closure, would have to be managed as a RCRA hazardous waste if the contaminates were initially considered RCRA hazardous waste.

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"CERCLA requires any person in charge of a facility to notify the National Response Center immediately when he or she has knowledge of any release of a hazardous substance from that facility in a quantity equal to or greater than the "reportable quantities" listed by the EPA. CERCLA § 103."

See: [https://www.epa.gov/epcra/cercla-and-epcra-continuous-release-reporting] 'CERCLA and EPCRA Continuous Release Reporting' U.S. EPA

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Given the persistent nature of many of the Hazardous & Toxic substances found on the DuPont Site this type of treatment does nothing to reduce the overall toxicity and hazards presented by the wastes but does increase the volume of the wastes in an effort to achieve a passing result on TCLP leaching tests for Characteristic Toxicity.

This "treatment" is in direct conflict with the law. The requirements of the Superfund Amendments and Reauthorization Act (SARA): SARA requires U.S. EPA to give preference to and use permanent solutions and alternative treatment technologies "to the maximum extent practicable" with "reductions in volumes, mobility, and toxicity" of the wastes.

Obviously the size and scope of the Releases that have taken place and are currently ongoing at the DuPont Site exceed the Reportable Quantities under federal and state laws & regulations for Hazardous or Toxic Substances & Wastes and Pesticides.

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"Treatment" consisted largely of waste acid neutralization and settling out any precipitated solids.

At one time two Incinerators operated on site – production wastes were burned in on-site and off-site incinerators…

Disposal methods included open piles and open dumping of solid wastes and pumping liquid wastes into pits & lagoons.

Most of the waste disposal sites are in areas of disturbed soils and/or infill areas of the original dune and swale topography which can be observed in a portion of the DuPont Property's Natural Area.

Solid Waste disposal took place all the way to the Rail Road Right-Of-Way on the north side of the DuPont Property and the Rail Road

In one case Storm Water Runoff was directed to an ash lined trench to drain into the groundwater in the north of the site.

Wastewater was discharged into the Grand Calumet River through 13 Outfalls over the years...

The amount of toxic & hazardous waste dumped over the facilities 105 year production history is enormous and DowDuPont – Chemours has been for years Actively Managing Hazardous & Toxic Waste onsite continuously without many of the required permits and without public knowledge and public comment periods the issuance of such permits would provide.

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Disposal methods included open piles and open dumping of solid wastes and pumping liquid wastes into pits & lagoons.

Most of the waste disposal sites are in areas of disturbed soils and/or infill areas of the original dune and swale topography which can be observed in a portion of the DuPont Property's Natural Area.

Solid Waste disposal took place all the way to the Rail Road Right-Of-Way on the north side of the DuPont Property and the Rail Road

In one case Storm Water Runoff was directed to an ash lined trench to drain into the groundwater in the north of the site.

Wastewater was discharged into the Grand Calumet River through 13 Outfalls over the years...

The amount of toxic & hazardous waste dumped over the facilities 105 year production history is enormous and DowDuPont – Chemours has been for years Actively Managing Hazardous & Toxic Waste onsite continuously without many of the required permits and without public knowledge and public comment periods the issuance of such permits would provide.

DuPont Site Listed Hazardous Wastes & Reportable Quantities

DuPont, now Chemours, has been Actively Managing Hazardous & Toxic Wastes at their now abandoned East Chicago Facility that operated 105 years manufacturing chemicals and pesticides in Northwest Indiana.

DuPont applied for and then withdrew an Application for a Resource Conservation Recovery Act (RCRA) Hazardous Treatment – Storage – Disposal Permit. Neither the United States Environmental Protection Agency (U.S. EPA) nor the Indiana Department of Environmental management (IDEM) took any action to require the largest chemical and pesticide manufacturing facility in the country to comply with the federal & state hazardous waste laws…

Obviously the size and scope of the Releases that have taken place and are currently ongoing at the DuPont Site exceed the Reportable Quantities under federal and state laws & regulations for Hazardous or Toxic Substances & Wastes and Pesticides.

Waste Disposal Practices at Grasselli Chemical Company & E. I. DuPont de Nemours and Company in East Chicago, Indiana can be summed up as follows: Throw it out behind the building…

Both Hazardous & Toxic waste byproducts and Hazardous off-specification products were dumped and spilled into the nearby air, land and water.

The DuPont East Chicago Facility was not only engaged in the Generation & Storage of Hazardous Wastes but also performed On-Site Treatment and/or Disposal of Hazardous Wastes during decades of manufacturing chemicals and pesticides.

"Treatment" consisted largely of waste acid neutralization and settling out any precipitated solids.

At one time two Incinerators operated on site – production wastes were burned in on-site and off-site incinerators…

Disposal methods included open piles and open dumping of solid wastes and pumping liquid wastes into pits & lagoons.

Most of the waste disposal sites are in areas of disturbed soils and/or infill areas of the original dune and swale topography which can be observed in a portion of the DuPont Property's Natural Area.

“Section 3005 of RCRA prohibits the operation of hazardous waste treatment, storage, or disposal facilities without a permit. EPA interprets the term "disposal" for purposes of RCRA Subtitle C regulation to have the same meaning as the term "land disposal" as defined under section RCRA 3004(k). Therefore, conducting any of the activities that constitute "land disposal" of hazardous waste will subject the unit to Subtitle C permitting and land disposal restrictions. "Land disposal" occurs when hazardous wastes are placed into a unit, including when hazardous wastes from different units are consolidated into one unit, or removed and treated outside a unit and redeposited, or treated within the unit in an incinerator, impoundment, or tank and then redeposited." – 'clarification of the Agency's interpretation of "active management"' United States Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C., (9484.1994(01)), April 6, 1994

“However, if the reactive media is installed by a high-pressure jetting technique or by vertical hydraulic fracturing, a permit may, in some circumstances, be required. The need for a permit under these conditions will be a state-by-state determination.

If USEPA has not delegated the UIC program to the state, the regional USEPA office makes the determination. A review of the pertinent regulations should project. w th be conducted during initial design stages of the project.”

“However, contaminated soil, groundwater, or reactive material that is brought to the surface, such as during PRB construction or closure, would have to be managed as a RCRA hazardous waste if the contaminates were initially considered RCRA hazardous waste.

Closure plans, similar to the closure plan requirements for RCRA facilities, should be developed to consider and address these issues."

See: [https://www.itrcweb.org/Guidance/GetDocument?documentID=68] 'Permeable Reactive Barriers: Lessons Learned/New Directions' by The Interstate Technology & Regulatory Council Permeable Reactive Barriers Team, February 2005

Many of the liquid and solid wastes that historically were generated or are currently being produced at the DuPont Site are Listed Wastes under federal laws and regulations.

These wastes have been dug up and “treated” on-site by mixing (diluting) with non-hazardous filler and high pH materials in order to pass the Characteristic Hazardous Waste Toxicity Characteristic Leaching Procedure (TCLP) test and then landfilled in the

Ash Dump SWMU A-1 and/or currently operating and exempt for regulation Special Waste Type IV Landfill.

Given the persistent nature of many of the Hazardous & Toxic substances found on the DuPont Site this type of treatment does nothing to reduce the overall toxicity and hazards presented by the wastes but does increase the volume of the wastes and achieve a passing result on TCLP leaching tests for Characteristic Toxicity.

This "treatment" is in direct conflict with the law. The requirements of the Superfund Amendments and Reauthorization Act (SARA): SARA requires U.S. EPA to give preference to and use permanent solutions and alternative treatment technologies "to the maximum extent practicable" with "reductions in volumes, mobility, and toxicity" of the wastes.

DuPont East Chicago Indiana Product List...

* THIS IS NOT A COMPLETE LIST OF POTENTIAL CONTAMINATES FROM THE EAST CHICAGO DUPONT FACILITY *

"29-NOV-88 - APPENDIX B - PAGE 1

DUPONT EAST CHICAGO, INDIANA PROOUCTION HISTORY

PROOUCTS

2 4-D Sodium weed killer - 83 % (1946 -1946);
4-Al I Drain Solvent (1924 -1926);
Acetic Acid - Gray Lime acetate (1902 -1930);
Acetic Acid - Purchased and rehandled (1930 – 1982);
Adhesive # 60 (Weather Proof) (1954 – 1963);
Adhesive # 71 (Weather Proof) (1949 – 1951);
Adhesive # 72 (Weather Proof) (1949 – 1951);
Adhesive # 73 (Weather Proof) (1946 – 1952);
Adhesive # 77 (Weather Proof) (1944 – 1963);
Adhesive # 78 (Weather Proof) (1944 – 1963);
Adhesive # 78X (Weather Proof) (1958 – 1963);
Ammonium Chloride Solution (1947 – 1975);
Ammonium Chloride – HCl (1954 – 175);
Ammate Solution (1959 – 1978);

Ammate X (1959 – 1978);
Ammonium Chloride (1909 – 1928);
Ammonium Chloride from new leaded crystal (1928 – 1963);
Ammonium Chloride - new facilities (1963 – 1969);
Ammonium Hydroxide Reagent (1899 – 1906);
Ammonium Hydroxide Reagent - new facilities (1958 – 1984);
Anisole (1948 – 1949);
Arsenate Green (1926 – 1926);
Arsenic Acid (1914 – 1949);
Barium Fluorosilicate (insecticide) (1930 – 1943);
Benlate (1968 – 1971);
Benomyl(1968 – 1970);
Bordeaux Mixture (fungicide) (1910 – 1940);
C & C Mixture (Zn Cl2 and Muriatic) (1944 – 1964);
Calcium Arsenate (1919 – 1948);
Calcium Arsenite (1927 – 1931);
Chlorosulfonlc Acid (1966 – 1984);
Chromated Zinc Chloride Dry (1940 – 1969);
Chromated Zinc Chloride Solution (1947 – 1969);
Collodial Silica 1A (1955 – 1957);
Collodial Silica # 17 (1956 – 1956);
Copperized Chromated Zinc Chloride Dry (1950 – 1964);
Copperized Chromated Zinc Chloride Solution (1951 – 1951);
Deenate 25W (insecticide) (1945 – 1946);
Deenate 50W (Insecticide) (1946 – 1947);
Detergents (1932 – 1951);
Disodium Phosphate Crystal (1926 – 1937);
Duclean #1 Inhibited Sulfuric Acid (1929 – 1984);
Duclean # 2 Inhibited Hydrochloric Acid (1931 – 1977);
EPN 300 Insecticide (1950 – 1952);
EPN 45% Emulsified (1952 – 1953);
EPN Miticide (1950 – 1952);
Fenuron (1964 – 1964);
Ferric Sulfate (Copperous) (1909 – 1920);
Fluorosulfonlc Acid (1975 – Present [1990]);
Freon - Kinetics Operation (1948 -1977);
Garden and Potato Dust (1944 – 1944);
Glattie (1909 – 1910)
Glauber's Salt (Sodium Sulfate) (1898 – 1948);
Hydrochloric Acid and Salt Cake - Mechanical furnace (1936 – 1959);

DuPont's East Chicago Process Flow Diagrams indicate the production numerous Listed Hazardous & Toxic Products and Waste Byproducts.

See: [https://semspub.epa.gov/work/05/938054.pdf] 'CH2M HILL - PHASE I GROUNDWATER ASSESSMENT(246 pp, 23.9 MB)' U.S. EPA January 9, 2018

See: [https://www.ecfr.gov/cgi-bin/text-idx?SID=7b27c58c5ffd5506a5eff0dd58ffca4f&node=pt40.28.302&rgn=div5] 'Title 40: Protection of Environment, PART 302—DESIGNATION, REPORTABLE QUANTITIES, AND NOTIFICATION' December 22, 2017

Storm Water Runoff and Discharges to Surface and/or Ground Water
Rule 6. Storm Water Discharges Exposed to Industrial Activity

327 IAC 15-6-1 Purpose
Sec. 1. The purpose of this rule is to establish requirements for storm water discharges exposed to industrial activity that are composed entirely of storm water and allowable nonstorm water to protect the public health, existing water uses, and aquatic biota."

"If an allowable nonstorm water discharge is determined to be a significant contributor of pollutants to a water of the state an individual wastewater permit may be required for the discharge."

(5) Have industrial activities classified by one (1) or more of the following categories:

(A) Facilities classified under the following SIC codes:

(ix) 28 (chemicals and allied products)

(xiv) 33 (primary metal industries)

(xx) 39 (miscellaneous manufacturing industries)

(C) Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of the Resource Conservation and Recovery Act (RCRA), (42 U.S.C. 6921).

(D) Except for those facilities identified in subsection (f), landfills, land application sites, open dumps, and transfer stations that receive, or have received, industrial process wastes, as defined in rules of the board at 329 IAC 10-2-95, from any of the types of facilities described under this subdivision."

USS Lead Explanation of Significant Differences (ESD)

There will always be significant differences so long as U.S. EPA continues to make decisions concerning the USS Lead Superfund Site in piecemeal manner…

This has been true from the beginning starting with the USS Lead Superfund Site's Hazard Ranking System (HRS) score.

"The HRS is the -primary way of determining whether a site is to be included on the National Priorities List (NPL), the Agency's list of sites that are priorities for long-term evaluation and remedial response, and is a crucial part of the Agency's program to address the identification of actual and potential releases." – U.S. EPA, December 14, 1990 Federal Register

"The ground water migration pathway, the soil exposure pathway, and the drinking water threat and human food chain threat of the surface water pathway were not scored as part of this Hazard Ranking System (HRS) evaluation. These pathways/components were not included because a release to these media does not significantly affect the overall site score and because the environmental threat component of the surface water migration pathway and the air pathway produce an overall site score well above the minimum required for the site to qualify for inclusion on the National Priorities List (NPL). These pathways are of concern to EPA and may be evaluated during future investigations."

See: [https://semspub.epa.gov/work/05/633063.pdf] 'HRS Documentation Record – Review Cover Sheet' U.S. EPA, September 2008

So what astronomical HRS score would the USS Lead Superfund Site reach if the ground water migration pathway, the soil exposure pathway, and the drinking water threat and human food chain threat of the surface water pathway were accurately scored as part of this Hazard Ranking System (HRS) evaluation?

More importantly, how would a comprehensive understanding of the full extent of contamination from the air to the land and the water, including groundwater; significantly affect not only the associated costs of cleanup but also the cleanup's effectiveness and permanence?

"An HRS score for a site is determined by evaluating four pathways:

Ground water migration;

Surface water migration (composed of the three threats — drinking water, human food chain, and environmental);

Soil exposure (composed of two threats — resident population and nearby population); and

Air migration."

See: [https://semspub.epa.gov/work/HQ/189159.pdf] 'The Hazard Ranking System Guidance Manual' U.S. EPA, EPA 540-R-92-026, November 1992

Besides ignoring established guidance documents, by leaving out significant exposure pathways, U.S. EPA embarked on an arbitrary piecemeal process that would lead to today's Explanation of Significant Difference (ESD) and will continue to fail to address the full extent of the contamination surrounding the USS Lead Superfund Site…

U.S. EPA's failure to comprehensively investigate all exposure pathways and determine the full extent of contamination lead to a Flawed Conceptual Site Model based only upon Aerial Deposition and Surface Water migration.

This ignored probable sources of potential contamination from fill historically used throughout the area to develop the Dune & Swale landscape and wetland areas adjacent to the Grand Calumet River following the establishment of the local Lead industries in East Chicago. Indiana.

It also ignores known groundwater contamination in the Calumet Sand Aquifer which is a dynamic water table aquifer that is directly hydraulically connected to Lake Michigan – that drinking water threat that U.S. EPA didn't score and continues to ignore.

That sand in the Calumet Sand Aquifer is mostly Quartz sand…

"All the sand deposits, whether wind or water laid, have very similar strength properties, are not plastic, and serve as excellent groundwater carriers."

"The sand units vary in mineralogy and, to a lesser degree, in grain size and shape. The most abundant sand-size mineral is quartz, which constitutes about 75 percent by weight of the sand -mineral suite."

See: [https://scholarworks.iu.edu/dspace/bitstream/handle/2022/241/SR11.pdf.txt;jsessionid=156CD21380DE1821526CC03D2F254189?sequence=3] 'Environmental Geology of Lake and Porter Counties, Indiana – An Aid to Planning ' by EDWIN J. HARTKE, JOHN R. HILL, and MARK RESHKIN, ENVIRONMENTAL STUDY 8, DEPARTMENT OF NATURAL RESOURCES GEOLOGICAL SURVEY SPECIAL REPORT 11

"Quartz is a compound of one part silicon and two parts of oxygen, Silicon dioxide, SiO_2."

"At room temperature, SiO_2 in all modifications is almost inert and does not react with most other substances. Even at moderately high temperatures silica is chemically very stable."

See: [http://www.quartzpage.de/gen_chem.html] 'The Quartz Page – Chemical Properties'

"The horizontal hydraulic conductivity of the Calumet aquifer within Lake County has been estimated by Rosenshein and Hunn (1968) to range from 10 to 130 ft/d and to average 60 ft/d (table 6).

The hydraulic conductivity of the aquifer also was estimated from an aquifer test at a well 1,300 ft northeast of the Midco I site (fig. 5). Calculated values of horizontal hydraulic conductivity ranged from 47 to 63 ft/d and averaged 53 ft/d (Geosciences Research Associates, Inc., 1987). A 15:1 ratio of horizontal to vertical hydraulic conductivity was estimated from the aquifer test.

Other estimates of horizontal hydraulic conductivity in local areas within the aquifer have ranged from less than 1 ft/d to 180 ft/d (table 6)."

See: [https://pubs.usgs.gov/wri/1992/4115/report.pdf] 'Geohydrology and Water Quality of the Calumet Aquifer, in the Vicinity of the Grand Calumet River/Indiana Harbor Canal, Northwestern Indiana' by JOSEPH M. FENELON and LEE R. WATSON, INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT and U.S. GEOLOGICAL SURVEY, Water-Resources Investigations Report 92-4115, 1993

Because of the above factors, the Calumet Sand Aquifer has a very low ability to "naturally attenuate" contaminates such as metals pollution and offers little resistance to the flow and spread of contamination throughout the aquifer once groundwater contamination is occurring...

Interior Dust Removals are being done under U.S. EPA's Removal Authorities and are not considered part of this ESD. This represents even more significant differences of cost in total dollars spent on cleanup at the USS Lead Superfund Site that are not addressed by this ESD... Why not?

U.S. EPA states that; "In 2014, OU1 was subdivided into three geographic "zones": Zones 1, 2, and 3" but provides no rational explanation on why the residential area of OU1 of the USS Lead Superfund Site must be subdivided – leaving Zone 2 out of the Consent Decree's cleanup plans and recently requiring U.S. EPA to issue Unilateral Administrative Orders in order to provide further cleanup in Zones 2 & 3. This is also not included in this ESD. Why not?

According to U.S. EPA "...the estimated rate for excavating and replacing one cubic yard of contaminated soil increased from $115 to $471."

At this level, the costs of excavating and replacing one cubic yard of contaminated soil at the USS Lead Superfund Site has now reached a level of what a permanent remedy that would require the removal and reclamation of the toxic metals from the soil would cost per yard... Yet that is not what is being provided to the community affected by the USS Lead Superfund Site or to the community hosting the disposal site...

For example, the Federal Remediation Technologies Roundtable has shown that: "The cost of soil washing decreases significantly with increasing volume (for the table shown it decreases from $142 to $53 per cubic yard, which makes soil washing much more cost effective for large projects (FDTR 2006)."

Another cost comparison point would include the costs of permanent relocation of residents where it is determined that such permanent relocation is cost effective or may be necessary to protect health or welfare versus current remedial costs and lack of permanence given the large amounts of contamination left behind within the community...

See: [http://www.geoengineer.org/education/web-based-class-projects/geoenvironmental-remediation-technologies/soil-washing?start=6] 'Soil Washing Costs'

All of this money spent and exactly zero reduction in the overall long-term toxicity of approximately 88,000 cubic yards of contaminated soil to be excavated and disposed of in another community.

The volume of the contaminated soil is actually increased due to mixing with sand and other materials to dilute and buffer the concentrations in the toxic soil in order to pass a leach test for disposal off-site in a landfill. But the total amount of toxic metals will remain unchanged as this so-called treatment offers zero percent recovery of any strategic or valuable metals...

What would the significant difference be in cost if strategic and valuable metals were recovered instead of just gathered up and reburied?

How significant could be the long-term threat reduction for public health be if toxic metals were permanently removed and recovered, reclaimed, or recycled instead?

According to U.S. EPA; "...excavation to native sand plus off-site disposal (Alternative 4B)" "The increased costs described above would proportionally increase the cost of Alternative 4B. Therefore, the reasons set forth in the ROD for not selecting Alternative 4B still apply at this time."

However U.S. EPA having not comprehensively addressed contamination in the USS Lead Superfund Site including the contaminated groundwater and its source(s) of contamination cannot continue to dismiss Alternative 4B as it may in fact prove to be a cost effective remedy that is consistent with the National Contingency Plan and the only effective way to stop further contamination of the groundwater and ultimately Lake Michigan given the site conditions.

U.S EPA has not adequately investigated the following within the USS Lead Superfund Site:

Potential Asbestos contamination from the demolition of former industrial manufacturing facilities;

Deeper Buried Solid &Hazardous Wastes (See: DuPont Example of "Native Sand" layer cake of Dumps upon Dumps throughout the soil column)

The potential for rapid migration of contaminates through the sandy soils and Calumet Sand Aquifer;

The potential for uptake of contaminates into plants and trees and subsequent fate of these contaminates within the community;

The impacts of migrating groundwater and its residues when evaporation takes place;

The active migration and or transformation of contaminates via microorganisms or other biological processes and the subsequent fate of these contaminates within the community;

U.S. EPA needs to be able to answer the following questions:

How much contamination (volume and concentration) of Hazardous & Toxic contaminates are being left behind in the community in total?

How much contamination (volume and concentration) of Hazardous & Toxic contaminates are being disposed of in the off-site community in total?

How many people currently live within the USS Lead Superfund Site?

How many children currently live within the USS Lead Superfund Site?

How many elderly persons currently live within the USS Lead Superfund Site?

How many people are tenants within the USS Lead Superfund Site?

How many property owners are there within the USS Lead Superfund Site?

How many business and institutions are there within the USS Lead Superfund Site?

What are the historical and current trends in the above demographics concerning the community affected by the USS Lead Superfund Site?

How does U.S. EPA plan to prevent the next generation of children from being impacted by the remaining Hazardous & Toxic contamination within the nearby community?

U.S. EPA needs to comprehensively investigate and map the full extent, breath & depth, of the Hazardous & Toxic contamination within the USS Lead Superfund Site from all sources of contaminates and then reevaluate any significant differences in determining whether or not the current removal actions and selected remedial activities are effective over the long-term in protecting human health and the environment and meet the requirements of the Superfund Amendments and Reauthorization Act to achieve a permanent remedy.

See: [https://www.epa.gov/sites/production/files/2015-02/documents/rod_guidance.pdf] 'A GUIDE TO PREPARING SUPERFUND PROPOSED PLANS, RECORDS OF DECISION, AND OTHER REMEDY SELECTION DECISION DOCUMENTS' U.S. EPA, EPA 540-R-98-031, July 1999

See: [https://semspub.epa.gov/work/HQ/100000349.pdf] 'Superfund Remedy Report 15th Edition' U.S. EPA, EPA-542-R-17-001 July 2017

See: [https://www.epa.gov/sites/production/files/2015-06/documents/leadcontam_sites.pdf] 'Superfund Engineering Issue – Treatment of Lead-Contaminated Soils' U.S. EPA, EPA 540-2-91-009, April 1991

See: [https://nepis.epa.gov/Exe/ZyPDF.cgi/10002SYY.PDF?Dockey=10002SYY.PDF] 'Fact Sheet A Citizen's Guide to Soil Washing'

See: [https://clu-in.org/download/remed/542r02004/arsenic_report.pdf] 'Arsenic Treatment Technologies for Soil, Waste, and Water' U.S. EPA, EPA 542-R-02-004, September 2002

See: [https://igws.indiana.edu/LakeRim/GrandCalGroundwaterInjuryReport.pdf] 'Surface-Water and Ground-Water Hydrology and Contaminant Detections in Ground Water for a Natural Resource Damage Assessment of the Indiana Harbor Canal and Nearshore Lake Michigan Watersheds, Northwestern Indiana' by David A. Cohen, Theodore K. Greeman and Paul M. Buszka, Administrative Report Prepared for the U.S. Department of the Interior, U.S. Geological Survey, U.S. Fish and Wildlife Service, Region 3, June 2002

See: [https://pubs.usgs.gov/wri/1995/4253/report.pdf] 'Geohydrology, Water Levels and Directions of Flow, and Occurrence of Light-Nonaqueous-Phase Liquids on Ground Water in Northwestern Indiana and the Lake Calumet Area of Northeastern Illinois' by Robert T. Kay, Richard F. Duwelius, Timothy A. Brown, Frederick A. Micke, and Carol A. Witt-Smith, U.S. GEOLOGICAL SURVEY Water-Resources Investigations Report 95-4253, 1996

Fenelon JM, Watson LR. 1993. Geohydrology and water quality of the Calumet aquifer, in the vicinity of the Grand Calumet River/ Indiana Harbor Canal, northwestern Indiana. Indianapolis (IN): US Geological Survey Water-Resources Investigations Report 92-4115. 151 p.

Greeman TK. 1995. Water levels in the Calumet aquifer and their relation to surface-water levels in northern Lake County, Indiana, 1985–92. Indianapolis (IN): US Geological Survey Water-Resources Investigations Report 94-4110. 61 p

See: [https://www.in.gov/dnr/water/files/Lake_County_UNC_AQSYS_map.pdf]
'Unconsolidated Aquifer Systems of Lake County, Indiana' Indiana Department of Natural Resources

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RE: Explanation of Significant Differences USS Lead Superfund Site, East Chicago, Indiana

USS Lead Explanation of Significant Differences (ESD)

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Because of the above factors, the Calumet Sand Aquifer has a very low ability to "naturally attenuate" contaminates such as metals pollution and offers little resistance to the flow and spread of contamination throughout the aquifer once groundwater contamination is occurring...

In other words, one way or another, the bulk of any unaddressed groundwater contamination of the Calumet Sand Aquifer will end up in Lake Michigan – the drinking water source for millions of people...

And given the dynamic nature of the water table within the Calumet Sand Aquifer its rise and fall will saturate and leach contaminates from any buried Hazardous & Toxic wastes that lie within the aquifer's ebb and flow directly into the groundwater.

The only way to prevent this is to completely identify all sources of contamination and recover, reclaim, recycle, and/or treat or destroy those sources of contamination.

According to the Explanation of Significant Differences (ESD) provided by U.S. EPA:

"...EPA determined that the actual volume of contaminated soil that needs to be excavated is greater than what was originally estimated" and,

""EPA has determined that the number of properties requiring remediation, the size of those properties, and the extent of contamination at those properties are all greater than what was originally estimated. These changes have increased the total estimated volume of contaminated soil to be excavated from approximately 47,000 cubic yards to approximately 88,000 cubic yards."

This is not surprising given that only 7.4% of the properties were sampled in Operable Unit 1 (OU1), the residential section of the USS Lead Superfund Site, during U.S. EPA's Remedial Investigation (RI) from June 2009 to June 2012.

Although U.S. EPA acknowledge "other sources of contamination from the USS Lead facility" such as "slag from the blast furnace was routinely placed in piles on the ground and left exposed to the elements" at the USS Lead Superfund Site it fails to account for the total volume of Hazardous & Toxic wastes that were generated at each facility over its lifetime of production and the fate of those wastes – including whether or not any of these wastes were used as fill within nearby communities.

By only taking shallow samples, U.S. EPA has not confirmed the true extent of contamination beneath OU1, the residential section of the USS Lead Superfund Site. U.S. EPA has not determined whether or not sources of contamination lie buried deeper within the Superfund Site.

One only has to examine soil boring logs taken next door at the DuPont Site that indicate a historic layer-cake of solid waste disposal practices and locations interspersed with layers of sand descending underground…

Thus U.S. EPA's assumption that native sand has been reached when sand is encountered during cleanups without any comprehensive deeper sampling for contamination is naive at best given the industrial nature of the surrounding area and its historical use of waste for infill for development and known solid waste disposal practices in the area over time.

By selecting a remedy for OU1, the residential section of the USS Lead Superfund Site, that limits removal of sources of contamination to 24 inches, U.S. EPA assures that unknown quantities of contaminated soils and potential sources of contamination will persist long into the future demonstrating the significant difference between a full and permanent cleanup and a temporary and impermanent remedy that will result in future generations of chronic toxic exposures…

U.S. EPA's emphasis upon short-term remedy cost and whether a remedy is more or less burdensome is misplaced and instead should emphasize the efficiency, effectiveness, and permanence of any remedy in completely detoxifying all of the contamination present – which is the lowest cost remedy in the long-term.

Given the huge potential for rapid migration of contaminates through the Calumet Sand Aquifer, and given the known groundwater contamination from both the USS Lead Superfund Site and the DuPont Site next door, Five Year Reviews are not adequate to ensure any remedy, other than clean closure, is protective of human health and the environment.

Will U.S. EPA's inclusion into the USS Lead Superfund Site of off-site contaminated groundwater in OU1, the residential section of the USS Lead Superfund Site, from the DuPont Site result in another Explanation of Significant Difference?

As further illustration of the inadequacy of the USS Lead Superfund Site's Conceptual Site Model and selected Remedy, even though the Air Dispersion model of contamination for the USS Lead Superfund Site was recognized long ago, U.S. EPA only recently (2016) discovered dust contamination indoors in homes at levels as high as 32,000 mg/kg or ppm Lead and 880 mg/kg or ppm Arsenic inside a residence on the Superfund Site. It seems that whenever U.S. EPA finally gets around to testing for contamination in East Chicago, Indiana they have very little trouble finding it near adults and children.

Interior Dust Removals are being done under U.S. EPA's Removal Authorities and are not considered part of this ESD. This represents even more significant differences of cost in total dollars spent on cleanup at the USS Lead Superfund Site that are not addressed by this ESD... Why not?

U.S. EPA states that; "In 2014, OU1 was subdivided into three geographic "zones": Zones 1, 2, and 3" but provides no rational explanation on why the residential area of OU1 of the USS Lead Superfund Site must be subdivided – leaving Zone 2 out of the Consent Decree's cleanup plans and recently requiring U.S. EPA to issue Unilateral Administrative Orders in order to provide further cleanup in Zones 2 & 3. This is also not included in this ESD. Why not?

According to U.S. EPA "...the estimated rate for excavating and replacing one cubic yard of contaminated soil increased from \$115 to \$471."

At this level, the costs of excavating and replacing one cubic yard of contaminated soil at the USS Lead Superfund Site has now reached a level of what a permanent remedy that would require the removal and reclamation of the toxic metals from the soil would cost per yard... Yet that is not what is being provided to the community affected by the USS Lead Superfund Site or to the community hosting the disposal site...

For example, the Federal Remediation Technologies Roundtable has shown that: "The cost of soil washing decreases significantly with increasing volume (for the table shown it decreases from \$142 to \$53 per cubic yard, which makes soil washing much more cost effective for large projects (FDTR 2006)."

Another cost comparison point would include the costs of permanent relocation of residents where it is determined that such permanent relocation is cost effective or may be necessary to protect health or welfare versus current remedial costs and lack of permanence given the large amounts of contamination left behind within the community…

See: [http://www.geoengineer.org/education/web-based-class-projects/geoenvironmental-remediation-technologies/soil-washing?start=6] 'Soil Washing Costs'

All of this money spent and exactly zero reduction in the overall long-term toxicity of approximately 88,000 cubic yards of contaminated soil to be excavated and disposed of in another community.

The volume of the contaminated soil is actually increased due to mixing with sand and other materials to dilute and buffer the concentrations in the toxic soil in order to pass a leach test for disposal off-site in a landfill. But the total amount of toxic metals will remain unchanged as this so-called treatment offers zero percent recovery of any strategic or valuable metals…

What would the significant difference be in cost if strategic and valuable metals were recovered instead of just gathered up and reburied?

How significant could be the long-term threat reduction for public health be if toxic metals were permanently removed and recovered, reclaimed, or recycled instead?

According to U.S. EPA; "…excavation to native sand plus off-site disposal (Alternative 4B)" "The increased costs described above would proportionally increase the cost of Alternative 4B. Therefore, the reasons set forth in the ROD for not selecting Alternative 4B still apply at this time."

However U.S. EPA having not comprehensively addressed contamination in the USS Lead Superfund Site including the contaminated groundwater and its source(s) of contamination cannot continue to dismiss Alternative 4B as it may in fact prove to be a cost effective remedy that is consistent with the National Contingency Plan and the only effective way to stop further contamination of the groundwater and ultimately Lake Michigan given the site conditions.

U.S EPA has not adequately investigated the following within the USS Lead Superfund Site:

Potential Asbestos contamination from the demolition of former industrial manufacturing facilities;

Deeper Buried Solid &Hazardous Wastes (See: DuPont Example of "Native Sand" layer cake of Dumps upon Dumps throughout the soil column)

The potential for rapid migration of contaminates through the sandy soils and Calumet Sand Aquifer;

The potential for uptake of contaminates into plants and trees and subsequent fate of these contaminates within the community;

The impacts of migrating groundwater and its residues when evaporation takes place;

The active migration and or transformation of contaminates via microorganisms or other biological processes and the subsequent fate of these contaminates within the community;

U.S. EPA needs to be able to answer the following questions:

How much contamination (volume and concentration) of Hazardous & Toxic contaminates are being left behind in the community in total?

How much contamination (volume and concentration) of Hazardous & Toxic contaminates are being disposed of in the off-site community in total?

How many people currently live within the USS Lead Superfund Site?

How many children currently live within the USS Lead Superfund Site?

How many elderly persons currently live within the USS Lead Superfund Site?

How many people are tenants within the USS Lead Superfund Site?

How many property owners are there within the USS Lead Superfund Site?

How many business and institutions are there within the USS Lead Superfund Site?

What are the historical and current trends in the above demographics concerning the community affected by the USS Lead Superfund Site?

How does U.S. EPA plan to prevent the next generation of children from being impacted by the remaining Hazardous & Toxic contamination within the nearby community?

U.S. EPA needs to comprehensively investigate and map the full extent, breath & depth, of the Hazardous & Toxic contamination within the USS Lead Superfund Site from all sources of contaminates and then reevaluate any significant differences in determining whether or not the current removal actions and selected remedial activities are effective over the long-term in protecting human health and the environment and meet the requirements of the Superfund Amendments and Reauthorization Act to achieve a permanent remedy.

See: [https://www.epa.gov/sites/production/files/2015-02/documents/rod_guidance.pdf] 'A GUIDE TO PREPARING SUPERFUND PROPOSED PLANS, RECORDS OF DECISION, AND OTHER REMEDY SELECTION DECISION DOCUMENTS' U.S. EPA, EPA 540-R-98-031, July 1999

See: [https://semspub.epa.gov/work/HQ/100000349.pdf] 'Superfund Remedy Report 15th Edition' U.S. EPA, EPA-542-R-17-001 July 2017

See: [https://www.epa.gov/sites/production/files/2015-06/documents/leadcontam_sites.pdf] 'Superfund Engineering Issue – Treatment of Lead-Contaminated Soils' U.S. EPA, EPA 540-2-91-009, April 1991

See: [https://nepis.epa.gov/Exe/ZyPDF.cgi/10002SYY.PDF?Dockey=10002SYY.PDF] 'Fact Sheet A Citizen's Guide to Soil Washing'

See: [https://clu-in.org/download/remed/542r02004/arsenic_report.pdf] 'Arsenic Treatment Technologies for Soil, Waste, and Water' U.S. EPA, EPA 542-R-02-004, September 2002

See: [https://igws.indiana.edu/LakeRim/GrandCalGroundwaterInjuryReport.pdf] 'Surface-Water and Ground-Water Hydrology and Contaminant Detections in Ground Water for a Natural Resource Damage Assessment of the Indiana Harbor Canal and Nearshore Lake Michigan Watersheds, Northwestern Indiana' by David A. Cohen, Theodore K. Greeman and Paul M. Buszka, Administrative Report Prepared for the

U.S. Department of the Interior, U.S. Geological Survey, U.S. Fish and Wildlife Service, Region 3, June 2002

See: [https://pubs.usgs.gov/wri/1995/4253/report.pdf] 'Geohydrology, Water Levels and Directions of Flow, and Occurrence of Light-Nonaqueous-Phase Liquids on Ground Water in Northwestern Indiana and the Lake Calumet Area of Northeastern Illinois' by Robert T. Kay, Richard F. Duwelius, Timothy A. Brown, Frederick A. Micke, and Carol A. Witt-Smith, U.S. GEOLOGICAL SURVEY Water-Resources Investigations Report 95-4253, 1996

Fenelon JM, Watson LR. 1993. Geohydrology and water quality of the Calumet aquifer, in the vicinity of the Grand Calumet River/ Indiana Harbor Canal, northwestern Indiana. Indianapolis (IN): US Geological Survey Water-Resources Investigations Report 92-4115. 151 p.

Greeman TK. 1995. Water levels in the Calumet aquifer and their relation to surface-water levels in northern Lake County, Indiana, 1985–92. Indianapolis (IN): US Geological Survey Water-Resources Investigations Report 94-4110. 61 p

See: [https://www.in.gov/dnr/water/files/Lake_County_UNC_AQSYS_map.pdf] 'Unconsolidated Aquifer Systems of Lake County, Indiana' Indiana Department of Natural Resources

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RE: Proposed Record Of Decision Amendment for the U.S. Smelter and Lead Refinery, Inc. Superfund Site in East Chicago, Lake County, Indiana – EPA ID: IND047030226

Hello Janet, Please find attached additional Written Comments on the Proposed Record Of Decision (ROD) Amendment for the U.S. Smelter and Lead Refinery, Inc. Superfund Site in East Chicago, Lake County, Indiana (USS Lead Superfund site).

Review of facts in the Administrative Record and related documents for the U.S. Smelter and Lead Refinery, Inc. Superfund Site indicate that:

East Chicago, Indiana, has a polluted environment that with an established cancer risk of 310 in 1,000,000 when 1 in 1,000,000 is considered an acceptable risk by U.S. EPA.

East Chicago, Indiana, is a recognized Environmental Justice (EJ) community. U.S. EPA "...Region 5 considers this site a high-priority potential EJ area of concern."

The USS Lead Superfund Site was: "...the highest ranking in Region 5 under the National Corrective Action Prioritization System and it was proposed for the National Priority List (NPL) in 1987." "EPA listed the USS Lead site to the National Priorities List (NPL) in 2009."

The West Calumet Housing Complex (WCHC) in Zone 1 of the Superfund site is where a toxic crime against humanity took place for 44 years where people of color were knowingly and deliberately located upon contaminated land without their knowledge.

"...observations across almost 20 years demonstrate a consistent pattern of elevated blood lead levels in young children" living in the Calumet neighborhood of East Chicago.

On September 12, 1985 Indiana Department of Environmental Management (IDEM) inspector Ted Warner took soil samples at USS Lead Refinery, Inc. that showed:

"...results as high as 594,420 mg Pb/g (ppm)" – in other words, contaminated soil that was over half Lead in its composition!

Subsequent to this discovery, U.S.S. Lead Refinery, Incorporated signed on December 7, 1989 a Partial Interim Agreed Order with IDEM (Cause No. N-296) which states that: "Said plan shall include a sampling and analysis plan for all contaminated areas to determine the extent, area and depth of contamination and a cleanup plan that addresses what remedial action will be preformed to ensure the removal of all contamination." Why should the residents of the Calumet neighborhood get a cleanup that is anything less than what was agreed to by Responsible Parties thirty years ago?

U.S. EPA continues to address the massive amounts of contamination in this community in a piecemeal fashion instead of comprehensively investigating all contamination and permanently cleaning it all up...

Look at the 14 acre Corrective Action Management Unit (CAMU) a land disposal site created as an Interim Stabilization Measure in 1996 where: "... the worst releases of hazardous waste constituents at the facility," including untreated Listed Hazardous Wastes such as K061, were disposed of – Hazardous Wastes that otherwise would be banned from land disposal.

U.S. EPA stated in their response to public comments on the USS Lead superfund Site's Consent Decree that: "....some of the material that will be excavated and require disposal will be hazardous waste; the corrective action management unit located within the USS Lead facility is not a hazardous waste landfill and cannot accept such wastes."

Compare that with U.S. EPA's affirmation in their 2014 Responsiveness Summary for the USS Lead Superfund Site Record Of Decision (ROD) which states that: "The residential portion of the USS Lead Site is located within an environmental justice community that is already home to several disposal facilities. Further disposal at the USS Lead property, immediately adjacent to the southern edge of OU1, would increase the environmental burden already born by the residents of OU1." Obviously that was not U.S. EPA's thinking when they constructed the CAMU or added more toxic wastes to the dumps at the DuPont Site in the Calumet community of East Chicago, Indiana...

It should be noted that this CAMU is now considered a final remedy & disposal site by U.S. EPA for hazardous wastes that were reburied in the Calumet community of East Chicago, Indiana even though U.S. EPA has declared that: "Interim measures are a way of expediting the protection of human health and the environment, but they do not represent final remedies for remediation of contamination at facilities."

The same is true for the adjacent former DuPont Site where U.S. EPA dug up, transported, and disposed of both Listed & Characteristic Hazardous Wastes closer to residents homes in the community. This dump was suppose to undergo Closure in the 1980s when interim RCRA status was lost but is still operating today as an IDEM conditionally exempt landfill which cannot meet any minimum requirements for: location, design, construction, and/or operation of a toxic or hazardous land disposal facility under current laws and regulations.

Now U.S. EPA wants to take similar inadequate measures in the cleanup of the former West Calumet Housing Complex in Zone 1 of the Superfund site. U.S. EPA ignores clear evidence of on-going releases of toxic & hazardous wastes and vapor intrusion hazards from subsurface wastes, contaminated groundwater, and deep buried debris from historic primary metals processing and pesticide manufacturing facilities...

Amereco Engineering prepared a WCHC Site Assessment which states that; "…multiple Polynuclear Aromatic Hydrocarbons (PAHs) were identified in exceedance of Indiana Department of Environmental Management (IDEM) Remediation Closure Guide (RCG) Residential Direct Contact (RDC) Screening Levels (SLs) and Soil Migration to Groundwater (MTG) SLs in subsurface soils. Please be advised that metals were also identified in subsurface soils in exceedance of IDEM RCG SLs for MTG, Residential and Industrial direct contact. Additionally, Lead and Arsenic were identified in exceedance of IDEM RCG Excavation Worker Direct Contact SLs in subsurface soils. Concentrations as high as 45,000 mg/Kg and 5,200 mg/Kg, respectively were identified"

and "…benz(a)anthracene was identified in groundwater sample WCG-014 in exceedance of the IDEM RCG SLs." and "A release has been confirmed onsite and is suspected to be associated with the historic oil pump room and operations."

Benz(a)anthracene is a high-molecular-weight, 4-ring PAH that is an odorless and colorless to yellow-brown hazardous substance with cancer causing properties. Its General Hazard/Toxicity Summary states that: "The heavier (4-, 5-, and 6-ring) PAHs are more persistent than the lighter (2- and 3-ring) PAHs and tend to have greater carcinogenic and other chronic impact potential [796]." 'Environmental Contaminants Encyclopedia' – National Park Service, Water Resources Division, 1997

"Based on the findings of the subsurface investigation, exposure pathways were identified onsite. Specific hazards identified include subsurface soils, groundwater and soil vapors." – 'Phase II Environmental Site Assessment for the West Calumet Housing Complex' Amereco Engineering, February 15, 2017

Additional evidence of on-going releases of toxic & hazardous substances is provided by Tetra Tech's 2015 Grand Calumet River/Indiana Harbor Canal Feasibility Study sampling results which confirm high levels or "hot spots" for toxic Metals and PCB contamination in surface sediment samples (i.e. recently deposited) in the Indiana

Harbor Canal directly adjacent to the former West Calumet Housing Complex, Goodman Park, and Carrie Gosh School in Zone 1.

U.S. EPA has inexplicably modified the area of the USS Lead Superfund Site by excluding the former Carrie Gosh School that is still used by adults and children even though U.S. EPA's previous illustrations of the Superfund Site show this and adjacent areas within the footprint of the former Anaconda Lead Products facility and aerial reconnaissance surveys indicate industrial use/landfill deposition in this area over time...

"The Anaconda Copper Company was located on the area now occupied by the Gosch Elementary School and a public housing residential complex (the southwest portion of OU1). The Gosch Elementary School and the East Chicago public housing complex were built on the former Anaconda Copper Company site after 1959." – CH2M, 2013

U.S. EPA has arbitrarily and capriciously argued both for and against on-site/off-site disposal & *in-situ/ex-situ* chemical stabilization for excavated wastes in their responses to public comments from the community concerning the USS Lead Superfund and DuPont sites whenever it supports U.S. EPA's selected remedies or final decisions...

"The excavation and transport of such large quantities of material pose significant threats to human health and the environment. This is due to the possibility of exposure from airborne dust from removal or transportation accidents resulting from the many truckloads of material that must be removed." – U.S. EPA's Response to Public Comments on the USS Lead Superfund Site CAMU, June 1996

"...risks can be mitigated by implementing a project-specific health and safety plan, keeping excavation areas properly wetted to reduce the creation of dust, planning truck routes to minimize disturbances to the surrounding community, and other best management practices." – U.S. EPA's Proposed Record Of Decision Amendment for the USS Lead Superfund Site, November 2018

"The recommended corrective measures with respect to the site conceptual model and remedial action objectives are summarized as follows:" "In-situ treatment of soil below the water table within the source area excavations where saturated soil concentrations warrant treatment will further reduce the arsenic source to groundwater." – Excerpt of U.S. EPA's Statement Of Basis for the DuPont East Chicago Facility, November 2017

"Alternative 5 was eliminated because there is insufficient evidence supporting the long-term effectiveness of *in-situ* stabilization." – U.S. EPA's Proposed Record Of Decision Amendment for the USS Lead Superfund Site, November 2018

Also U.S. EPA has recently approved a permit for a 180 acre PCB dump in East Chicago, Indiana – the Indiana Harbor and Canal Confined Disposal Facility (IHC CDF).

The IHC CDF is located less than one-half mile from: city parks, residential neighborhoods, East Chicago's Central High School, and the new Carrie Gosh Elementary School – relocated from the USS Lead Superfund Site...

The IHC CDF cannot meet any minimum requirements for location, design, construction, and/or operation of a land disposal facility under the law.

"The cancer risk due to inhalation exposure to CDF emissions is estimated to be 2.3 x 10-6 (2.3 in 1,000,000). Based on air monitoring data, the total estimated cancer risk due to air toxics inhalation exposure from other sources in the area (i.e., without including CDF emissions) for 30 years is estimated to be 3.1 x 10-4 (3.1 in 10,000 or 310 in 1,000,000)." – Harold Henderson

At this point how can anyone believe that U.S.EPA is really protecting public health and the environment in East Chicago, Indiana? U.S. EPA destroyed any credibility upon the approval of the 180 acre IHC CDF's TSCA PCB disposal permit next to East Chicago's elementary and high schools.

This ROD Amendment should treat all of the residential area of the USS Lead Superfund site equally and comprehensively as one Superfund site!

This ROD Amendment should prefer Remedial Action Alternative 4D "Residential excavation to native sand and disposal. This alternative consists of removing approximately 262,350 cubic yards of contaminated material, including debris, at the site down to the depth of native sand. – U.S. EPA

This ROD Amendment should prefer a permanent solution using alternative treatment technologies "to the maximum extent practicable" with "reductions in volumes, mobility, and toxicity" of toxic & hazardous wastes instead of land disposal of toxic and contaminated remedial wastes – U.S. Congress

A permanent cleanup is economically and technically possible utilizing existing and proven technologies in a combined system of treatment technologies to separate, reclaim & recycle, decontaminate, and restore both soils and groundwater.

The most protective and lowest long-term cost cleanup is a permanent cleanup – one that eliminates toxic health threats and financial liabilities for both the PRPs and contaminated communities by using innovative technologies to remove and reclaim the sources of contamination from the community forever...

Sincerely [redacted]

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RE: Proposed Record Of Decision (ROD) Amendment for the U.S. Smelter and Lead Refinery, Inc. Superfund Site in East Chicago, Lake County, Indiana – EPA ID: IND047030226

Hello Janet, Please find attached my Written Comments on the Proposed Record Of Decision (ROD) Amendment for the U.S. Smelter and Lead Refinery, Inc. Superfund Site in East Chicago, Lake County, Indiana – EPA ID: IND047030226 (USS Lead Superfund site).

The U.S. Smelter and Lead Refinery, Inc. Superfund Site in East Chicago, Lake County, Indiana is situated in a recognized Environmental Justice Community, the Calumet neighborhood of East Chicago, Indiana, that is impacted by an ambient polluted environment that has an established cancer risk of 300 in 1,000,000 when 1 in 1,000,000 is considered an acceptable risk by U.S. EPA.

The West Calumet Housing Complex in the Calumet neighborhood is part of what U.S. EPA calls Zone 1 – there are 3 zones for the residential part of one Superfund site: the

USS Lead Superfund site… The West Calumet Housing Complex is the site where a toxic crime against humanity took place for 44 years – a community where people of color were knowingly and deliberately located upon land known to be contaminated without their knowledge until forced evacuations by the city of East Chicago in 2016.

Why are there divided zones for the residential part of one Superfund site and when will this question finally be answered and an honest explanation be given as to why Zone 2 was completely left out of the USS Lead Superfund site's Consent Decree and had to be addressed through Unilateral Administrative Orders (UAOs) finally issued in 2018?

"…observations across almost 20 years demonstrate a consistent pattern of elevated blood lead levels in young children" living in the Calumet neighborhood of East Chicago, Indiana.

This ROD Amendment should treat all of the residential area of the USS Lead Superfund site equally and comprehensively as one Superfund site!

This ROD Amendment should prefer Remedial Action Alternative 4D "Residential excavation to native sand and disposal. This alternative consists of removing approximately 262,350 cubic yards of contaminated material, including debris, at the site down to the depth of native sand. Excavated soil would be disposed of at an approved landfill and, as necessary, soil with the highest lead concentrations would be treated using chemical stabilization." – U.S. EPA

Why should the residents of the Calumet neighborhood and other parts of East Chicago, Indiana and nearby communities of Gary and Hammond, Indiana settle for any less than what the Responsible Party agreed to do back in 1989 in an Agreed Order with the Indiana Department of Environmental Management (IDEM) (Cause No. N-296) which required identification of the full extent of contamination from the USS Lead Superfund site and to clean it all up…?

"Said plan shall include a sampling and analysis plan for all contaminated areas to determine the extent, area and depth of contamination and a cleanup plan that addresses what remedial action will be preformed to ensure the removal of all contamination." – Cause No. N-296 Indiana Department of Environmental Management versus U.S.S. Lead Refinery, Inc. signed on December 7, 1989 by U.S.S. Lead Refinery, Incorporated.

Note the Agreed Order's requirement for a full investigation of the extent of contamination, including area and depth, – something still not completed by U.S. EPA and IDEM three decades later…!

Also note the Agreed Order's requirement to "remove all contamination" something similar to what Alternative 4D, the "most protective" cleanup alternative, would provide "…since all material, including debris would be excavated down to native sand and disposed of off-site."

In its November 2018 Proposed Record Of Decision Amendment for the USS Lead Superfund site U.S. EPA states that; "Because of the uncertainty in the future land use, EPA has included and evaluated an alternative that would be protective of human health and the environment under commercial or industrial use scenarios. Alternative 4A requires excavation of contaminated soils and other material exceeding industrial/commercial standards in the top 12", off-site disposal, ex-situ treatment options, and ICs."

Given the extreme proximity of residences, schools, parks, churches, businesses, etc., any selected cleanup remedy must require cleanup to residential standards or better!

This ROD Amendment should prefer a permanent solution using alternative treatment technologies "to the maximum extent practicable" with "reductions in volumes, mobility, and toxicity" of toxic & hazardous wastes instead of land disposal of toxic and contaminated remedial wastes – U.S. Congress

A permanent cleanup is economically and technically possible utilizing existing and proven technologies in a combined system of treatment technologies to separate, reclaim & recycle, decontaminate, and restore both soils and groundwater. However this will take both leadership and commitment on an industrial scale equal to the one that created the massive amounts of toxic contamination in the first place… U.S. EPA does not want to make such a commitment to the Calumet neighborhood of East Chicago, Indiana but rather would like to do the quickest and cheapest thing possible – grab a shovel and get a dump truck!

For example: East Chicago, Indiana is located upon the Calumet Sand Aquifer that is made up of 75% Quartz Sand by weight, is 40% permeable, and has horizontal hydraulic conductivity of an average 60 feet/day.

The Quartz Sand in the Calumet Sand Aquifer has a very low capability to absorb or "naturally attenuate" contaminates such as heavy metals and also has low resistance to the flow and spread of contamination throughout the aquifer once groundwater contamination occurs since Quartz (Silicon dioxide) is chemically inert…

However, this chemically inert Quartz Sand can be separated from its Toxic contaminates by using a cascading system of a common industrial sand separation technology known as: Hydrocyclone Separators.

Bethlehem Steel Corp. patented a cascading Hydrocyclone system for the separation of Lead and Zinc from Blast Furnace sludge in July of 1995.

Using Hydrocyclone inlet pressures two to three times normally used in mining and petroleum industries resulted in the removal of 80 to 90% of the Lead and Zinc in just a two stage cascading Hydrocyclone system…

After separation of clean chemically inert Quartz sand a 25% concentrate of Toxic contaminates remains to be dealt with…

Resource Recovery, Recycling, and Sale of valuable Strategic Minerals & Metals is possible utilizing various separation and recovery technologies.

One new Metals separation & recovery technology example is provided by a company called: Metals U.S. that has a patented solid phase separation technology for removal of Metals in pure form – at their highest economic value!

So valuable and strategic resources can be recovered and sold at their highest value to offset cleanup costs and for use in improving our nation's economy, strategic defense, and as rare earth minerals for manufacturing advanced technologies – instead of being persistent environmental poisons found in our communities…

The blank slate created with the demolition of the West Calumet Housing Complex and its 50 acre cleanup presents an opportunity for US EPA and IDEM to met the requirements of the "Superfund Amendments and Reauthorization Act of 1986 (SARA) which stresses the importance of and requires preference of permanent remedies and innovative treatment technologies in cleaning up hazardous waste sites. U.S. EPA has not chosen to do that with this ROD Amendment.

This ROD Amendment is an arbitrary, capricious, deficient, and discriminatory decision because of the following facts:

The selected Remedial Action, Alternative 4B, fails to eliminate the environmental and human health threats posed by all the known contaminates present within the USS Lead Superfund site by:

1) leaving vast quantities of toxic wastes, known sub-surface contamination & contaminated debris, and contaminated groundwater in place in the Calumet neighborhood of East Chicago, Indiana;

   "Based on the findings of the subsurface investigation, exposure pathways were identified onsite. Specific hazards identified include subsurface soils, groundwater and soil vapors." – 'Phase II Environmental Site Assessment for the West Calumet Housing Complex' Amereco Engineering, February 15, 2017

2) further spreading 4,000 truckloads of toxic contamination to another community for land disposal – what community will be the recipient of these toxic and contaminated wastes? – will this land disposal site be a future Superfund site?;

3) squandering millions of Responsible Party and U.S. Taxpayer dollars on an impermanent Cleanup that fails to achieve a permanent solution using alternative treatment technologies "to the maximum extent practicable" with "reductions in volumes, mobility, and toxicity" of toxic & hazardous wastes;

4) spending millions of dollars to throw away valuable and strategic resources including: antimony, arsenic, cadmium, chromium, copper, gold, iron, lead, manganese, selenium, silver, tin, zinc, beryllium, dysprosium, erbium, europium, gallium, gadolinium, hafnium, neodymium, platinum, praseodymium, and tellurium present in the contaminated wastes, soils, and groundwater…

   "Tellurium is among the rarest elements with crustal abundance levels at 0.001 mg/kg. However, it was found at levels ranging between 113 to 58,400 times that level in the off-site and on-site samples. The element clearly appears to have an anthropogenic source in the study area." – 'Characterization of the Lead and Other Metals in Soil in the vicinity of the USS Lead Site, East Chicago, Indiana' TechLaw, Inc., September 8, 2004

   U.S. EPA and IDEM have approved the use mixing and diluting other materials with the toxic and contaminated wastes in a treatment scheme <u>that will also make it more difficult to recover these resources in the future</u>. This being done in order to ensure passage of the Toxicity Characteristic Leaching Procedure

(TCLP) test required for land disposal. Otherwise most of these toxic wastes are banned from land disposal under current federal and state standards.

The mixed waste is declared no longer hazardous and land disposal takes place without any proof of the long-term effectiveness in preventing migration of persistent toxic contaminates from the landfill. Toxic Metals by their very nature are Elements that do not breakdown over time. This practice violates Land Disposal Restrictions (LDRs) for Listed Hazardous Wastes and persistent organic pollutants.

U.S. EPA's Mixture Rule makes it illegal to mix Listed Hazardous Wastes to avoid regulation under federal law. And Listed Hazardous Wastes are known to have been present in the USS Lead Superfund site…

5) not achieving a permanent solution to the threats from toxic contamination in the USS Lead Superfund site including leaving out entire communities (Gary, Hammond, and other parts of East Chicago, Indiana) located outside the current boundaries of the USS Lead Superfund site that have been shown to be impacted by the toxic contamination;

   The size of the USS Lead Superfund site should not be modified by a decrease in area by this ROD Amendment – which excludes the former Carrie Gosh School that is still used by adults and children. This ROD Amendment should instead expand the USS Lead Superfund site to include all known areas impacted by its toxic contamination including other parts of East Chicago, Hammond, and Gary, Indiana as illustrated by numerous documents already in the Administrative Record including the studies of Air Dispersion Modeling and Historical Aerial Photography Review of the USS Lead Superfund site. The potential exposure routes and sources of contamination include: contaminated soils, contaminated groundwater, buried sub-surface waste, toxic vapor intrusion, and contaminated dust within homes, schools, churches, businesses, etc.

6) ruling out other known Metal contaminates and entire classes of pollutants such as Polynuclear Aromatic Hydrocarbons (PAHs), Furans, and Dioxin known to be produced from the industrial processes such as Blast Furnaces, Smelters, and Metals Refining, etc. that historically occupied the USS Lead Superfund site as sampling results have found contaminates at elevated levels in soils and groundwater within and adjacent to the USS Lead Superfund site

"The ten elements identified at levels generally exceeding average crustal abundances and that are plotted on Figures 6-1 through 6-20 are antimony, arsenic, cadmium, copper, iron, lead, manganese, selenium, tin, and zinc." "In addition to lead, the metals antimony, arsenic and cadmium were found to be present at levels that exceed human health screening values such as the U.S. EPA Region 9 Preliminary Remediation Goals (PRGs) and relevant State criteria." – 'Characterization of the Lead and Other Metals in Soil in the vicinity of the USS Lead Site, East Chicago, Indiana' TechLaw, Inc., September 8, 2004

U.S. EPA concluded that; "PAH contamination in OU1 does not appear to be site-related; rather. It seems to be indicative of a highly industrial urban residential area. For that reason, PAHs are not considered a COC for OU1." – Joan Tanka, Chief, Remedial Response Branch 1 Superfund Division, U.S. EPA Region V, May 9, 2012

Amereco Engineering prepared a Phase II Environmental Site Assessment for the West Calumet Housing Complex dated February 15, 2017 which states that; "…multiple Polynuclear Aromatic Hydrocarbons were identified in exceedance of Indiana Department of Environmental Management (IDEM) Remediation Closure Guide (RCG) Residential Direct Contact (RDC) Screening Levels (SLs) and Soil Migration to Groundwater (MTG) SLs in subsurface soils. Please be advised that metals were also identified in subsurface soils in exceedance of IDEM RCG SLs for MTG, Residential and Industrial direct contact. Additionally, Lead and Arsenic were identified in exceedance of IDEM RCG Excavation Worker Direct Contact SLs in subsurface soils. Concentrations as high as 45,000 mg/Kg and 5,200 mg/Kg, respectively were identified" and

"…benz(a)anthracene was identified in groundwater sample WCG-014 in exceedance of the IDEM RCG SLs. Both samples were collected from soil boring SB-14 advanced in the location of the historic oil pump room. The historic oil pump room was identified on the historic Sanborn Maps to the southeast portion of the site. A release has been confirmed onsite and is suspected to be associated with the historic oil pump room and operations." (continues…)

U.S. EPA's own studies show that secondary Lead smelters using Blast Furnaces had the highest Toxic EQuivalency (TEQ) values for Dioxin and Dioxin-like compounds when compared to reverberatory and rotary furnaces…

7) using biased calculations to establish health risk and cleanup levels for the USS Lead Superfund site – for example: this ROD Amendment is based upon risk

calculations and an established cleanup level for Arsenic calculated using an original background level of 14.1 mg/kg (ppm) that was subsequently revised to 26 mg/kg (ppm) in 2016;

the arithmetic mean concentration in 106 soil samples collected within 500 kilometers of Chicago for Arsenic is 6.56 mg/kg (ppm) or background level according to the United States Geological Survey – USGS Water-Resources Investigations Report 03-4105 'Concentrations of Polynuclear Aromatic Hydrocarbons and Inorganic Constituents in Ambient Surface Soils, Chicago, Illinois: 2001-02';

"The site specific background concentration for arsenic in soils at the USS Lead site has been determined to be 26 milligrams of arsenic per kilogram of soil (mg/kg)." – 'Justification for Using Site-Specific Arsenic Background Concentration in Soil for Indoor Dust Screening Concentration for the USS Lead Site' by Keith Fusinski, PhD Toxicologist, US EPA Superfund Division, Remedial Response Branch #1, Science and Quality Assurance Section, U.S. EPA Region V, December 13, 2016;

8) using suspect screening and cleanup levels measured with XRF Technology to screen soil samples and bare excavated soils… The Work Plans for this ROD Amendment, as has been done elsewhere throughout the USS Lead Superfund site, utilize XRF Technology contaminate screening levels of 400 mg/kg Lead not the more protective recommended cutoff level of 235 mg/kg Lead;

"The lowest XRF sample results sent for laboratory confirmatory analysis were samples X36/S12 and X66/S20, with XRF values of 549 ppm and 586 ppm, respectively. The laboratory results for those samples (see Table 2) were 31.5% and 59.5% higher than those values. It is therefore recommended that XRF results as low as 235 mg/kg for lead be viewed with caution as possibly being over the 400 ppm screening level." – Final Report on X-Ray Fluorescence Field Study of Selected Properties in Vicinity of Former USS Lead Refinery Facility, East Chicago, Indiana' by Michael J. Mikulka, P.E. Field Project Manager and Mirtha Capiro, Project Manager, U.S. Environmental Protection Agency Region 5

This ROD Amendment is deficient and fails to evaluate numerous environmental and human exposure pathways including:

1) intrusion of toxic vapors from toxic sub-surface contaminated sources left in place in the highly permeable Quartz sand soils and Calumet Aquifer;

2) the contaminated surface water threat posed by the storm water and sewer systems for infiltrating contaminated surface water and/or groundwater – due to the deteriorated condition of these systems both infiltration and discharge of contaminated water can occur at various points in these systems;

3) the contaminated ground water migration pathway through the highly permeable Quartz sand soils of the Calumet Aquifer;

4) the windblown contaminated soil and transportation spillage exposure pathways;

5) the drinking water threat – the Calumet Aquifer discharges into the Grand Calumet River, Indiana Harbor Canal, or the city of East Chicago's storm water or sewer systems (there are three) all which eventually winds up directly or indirectly in Lake Michigan a source of drinking water for the region;

   the Calumet Aquifer is a Quartz sand water table aquifer that's hydraulically coupled to Lake Michigan and rises and falls with changes in Lake Michigan levels and is influenced by major precipitation events which directly infiltrate soils and recharge the saturated portion of the aquifer – seasonal high water table levels and floods are historically known to occur in the USS Lead Superfund site;

6) both the environmental and human food chain threat (e.g. fish, waterfowl, vegetable & fruit grown within or adjacent to the USS Lead Superfund site) of the surface water pathway – a bald eagle has been known to nest on-site; and

7) the migration, uptake, and fate of toxic contaminates in plants, shrubs, trees, insects, wildlife, or additional living populations found within or adjacent to the USS Lead Superfund site.

U.S. EPA's failures to comprehensively investigate all exposure pathways and determine the full extent of contamination lead to a Flawed Conceptual Site Model.

By only taking shallow samples, U.S. EPA has not confirmed the true extent of contamination beneath OU1, the residential section of the USS Lead Superfund Site.

U.S. EPA's assumption that native sand has been reached when sand is encountered during cleanups without any comprehensive deeper sampling for contamination is naive at best given the industrial nature of the surrounding area and its historical use of waste for infill for development and known solid waste disposal practices in the area over time – including U.S. Smelter and Lead Refinery, Inc. records of off-site slag sales!

One only has to examine soil boring logs taken right across Kennedy Avenue at the grossly contaminated DuPont Site that indicate a historic layer-cake of solid waste disposal practices and locations of interspersed layers of sand-waste-sand-waste-sand (dumps built upon dumps) descending underground...

U.S. EPA needs to comprehensively investigate and map the full extent, breath & depth, of the Hazardous & Toxic contamination within the USS Lead Superfund Site from all sources of contaminates and then reevaluate whether or not the current removal actions and selected remedial activities are effective over the long-term in protecting human health and the environment and meet the requirements of the Superfund Amendments and Reauthorization Act to achieve a permanent remedy.

U.S. EPA and IDEM have not adequately tested the USS Lead Superfund Site and adjacent areas for Dioxin and Dioxin-like Compounds.

This ROD Amendment is deficient and fails to evaluate whether the demolition and removal of "...barriers to resident's exposure to the lead and arsenic soil contamination" has changed exposure risks or increased migration of contaminates due to the exposure of more contaminated land surface area which increases surface water infiltration into sub-surface contaminated soils and debris.

In its November 2018 Fact Sheet concerning the Proposed Cleanup Plan for Residential Area, Zone 1 U.S. EPA states; "One consideration in selecting the 2012 plan was that EPA anticipated the houses and apartment buildings, along with the sidewalks and parking lots of the West Calumet Housing Complex, would act as barriers to resident's exposure to the lead and arsenic soil contamination. However, the closing and demolition of the WCHC removed all these barriers and the risk to human health and the environment that was originally calculated in the 2012 ROD has not changed."

If these "barriers to resident's exposure" have been removed how is it that the "...risk to human health and the environment" has not changed...?

This ROD Amendment is deficient and fails to evaluate whether a public health emergency exists due to the high level of multiple and chronic exposures to contaminates known to be present within and adjacent to the USS Lead Superfund site for adults and children living within the Superfund site and whether such exposures justify the voluntary evacuation of the residents living on top of the Superfund site – any such action should provide full compensation to relocate to clean uncontaminated businesses, churches, schools, and residences of equal or better condition and provide first return rights once their property is fully and permanently cleaned up.

This ROD Amendment is deficient and fails to give preference to and use permanent solutions and alternative treatment technologies "to the maximum extent practicable" with "reductions in volumes, mobility, and toxicity" of toxic & hazardous wastes – in fact, in its public meeting on this ROD Amendment, the U.S. EPA admitted that the selected Remedial Action Alternative 4B would increase the volume of toxic and contaminated remedial wastes.

Alternative 4B also fails to reduce the overall toxicity of the metals (elements – that never breakdown into non-toxic substances) which will be dumped via 4,000 truck loads into another community for land disposal – you can't get more mobile that that when you are a toxic or contaminated waste...

Was this ROD Amendment and its selected Remedial Action Alternative 4B based upon what is "most protective" or chosen because of its lower cost and expediency?

In addition, this ROD Amendment does nothing to adequately or comprehensively address these conditions within and adjacent to the USS Lead Superfund site:

1) the ongoing contamination of the groundwater;

2) the identification and removal of deeper buried toxic wastes and contaminated debris – some below the groundwater surface buried in the Calumet Aquifer's saturated zone – approximately 8 feet below the surface;

3) the identification and removal of sub-surface anthropogenic (man-made) sources of contamination for ongoing releases of toxic pollutants as evidenced by the known buried contaminated debris found 11 feet below the ground surface, leaking underground tanks, and high levels or "hot spots" for toxic Metals, PCBs and PAHs found in surface sediment samples (i.e. recently deposited) in the Indiana Harbor Canal directly adjacent to the former West Calumet Housing Complex, Goodman Park, and Carrie Gosh School (Zone 1). For example: what happened to the large transformers (potential sources of PCBs) used by several of the former smelter and metals refining operations on this Superfund site?

4) ignoring other known to be present anthropogenic (man-made) contamination by toxic pollutants such as PAHs and other persistent toxic organic pollutants in soil and groundwater within and adjacent to the USS Lead Superfund site.

U.S. EPA further states that: "Based on an assumption that the modified Zone 1 will remain residential, EPA's recommended alternative is Alternative 4B. This alternative calls for removing up to 2 feet of contaminated soil, laying down a barrier, and replacing the contaminated soil with clean soil. This alternative would protect residential redevelopment. EPA would place controls on the property to ensure the barrier stays in place. This alternative protects people and the environment, meets the applicable regulations, is cost-effective and will be effective in the long term."

Given that local building codes require foundation excavations to much greater than two feet and that utilities may be installed at similar or even greater depths than foundations how is it possible for Cleanup Plan Alternative 4B to "...protect residential redevelopment" when any kind of redevelopment will require digging deeper than two feet, disturb the installed "barrier," and expose un-remediated and uncontrolled deeper sub-surface contamination...?

In its November 2018 Proposed Record Of Decision Amendment for the USS Lead Superfund site U.S. EPA states; "...based on prior sampling that indicates widespread contamination below 24 inches below ground surface ("bgs"), see id., institutional controls will be required across the entire area of the proposed amendment."

Institutional Controls are inconsistent with any type of Permanent Cleanup required under SARA as the threat from toxic contamination left in place remains in the community forever.

"...certain kinds of action are inconsistent with permanence, including any form of land disposal or containment, and any use of engineering or institutional controls, including long term monitoring for releases. All of these mean:

Site hazardous material remains hazardous;

There is uncertainty about releases of hazardous material and, therefore, risks to health and environment; and

There are a host of uncontrollable possible future events which might compromise the effectiveness of the protection."

"...OTA disagrees with the notion that land disposal or engineering or institutional controls provide a "degree of permanence." What varies is the level of protection provided by different cleanup technologies and methods, not the degree of permanence." – U.S. Congress, Office of Technology Assessment

"In the FEDERAL REGISTER Feb. 5, 1981, the EPA first stated its opinion that all landfills will eventually leak:

"There is good theoretical and empirical evidence that the hazardous constituents that are placed in land disposal facilities very likely will migrate from the facility into the broader environment. This may occur several years, even many decades, after placement of the waste in the facility, but data and scientific prediction indicate that, in most cases, even with the application of best available land disposal technology, it will occur eventually." [pg. 11128]

"Manmade permeable materials that might be used for liners or covers (e.g., membrane liners or other materials) are subject to eventual deterioration, and although this might not occur for 10, 20 or more years, it eventually occurs and, when it does, leachate will migrate out of the facility." [pg. 11128]

"Unfortunately, at the present time, it is not technologically and institutionally possible to contain wastes and constituents forever or for the long time periods that may be necessary to allow adequate degradation to be achieved." [pg. 11129]

"Consequently, the regulation of hazardous waste land disposal facilities must proceed from the assumption that migration of hazardous wastes and their constituents and by-products from a land disposal facility will inevitably occur." [pg. 11129]

This ROD Amendment is falsely based upon the assumption that that no ecological habitat exists in Zone 1 when wildlife and waterfowl can be regularly observed nesting in the area and feeding upon its contaminated land and/or occupying the adjacent areas of the heavily contaminated Calumet River and Indiana Harbor Canal.

One of the ROD Amendment decision balancing criteria justification given by U.S. EPA of the selected Remedial Action 4B is the short time to implement the Remedial Action which is a 24 inch Removal Action for contaminated soil. This justification would hold water if it was the year 1987, instead of 2019, since IDEM and U.S. EPA have known about the high levels of contamination since 1985.

Attempts to justify an impermanent and incomplete cleanup of toxic contamination balanced on its quickness, lower costs, and administrative convenience rather than its permanence and reduction of toxicity, volume and mobility violates the intent of the National Contingency Plan (NCP) as well as federal and state requirements under RCRA, CERCLA (Superfund), SARA and internal U.S. EPA Guidance – including the planed hauling and dumping of 4,000 truckloads of toxic and/or contaminated soil into another community…

The U.S. EPA has the authority and ability to fund a permanent cleanup for the USS Lead Superfund site as there are numerous additional Potential Responsible Parties (PRPs) that could fund such an endeavor but U.S. EPA has chosen not to pursue additional PRPs to fund the cleanup while perpetually negotiating behind closed doors with the current recalcitrant PRPs that have been dragging their feet for 40 years…

The Calumet neighborhood deserves better! The people of East Chicago, Indiana and the rest of Northwest Indiana deserve a U.S. EPA that is "most protective" of people's lives and their environment – not a U.S. EPA that caters to and defends the corrupt never-ending removal and containment desires of the toxic merry-go-round of cleanup contractors, land disposal companies, and unenlightened PRPs taken along for a ride!

Given the total expenditures on the USS Lead Superfund site, well in excess of 50 million dollars – including incidental costs, to U.S. EPA and IDEM this ROD Amendment should not be exempt from the National Remedy Review Board's (NRRB) oversight and evaluation of the cleanup process at the USS Lead Superfund site. The current NRRB exemption should no longer apply given the history of large increases in contractor expenditures over time at the USS Lead Superfund site.

The most protective and lowest long-term cost cleanup is the most permanent cleanup – one that permanently eliminates the toxic health threats and financial liabilities for both the PRPs and contaminated communities by using innovative technologies to remove the sources of contamination from the community forever…

This can be accomplished through the reclaiming and recycling of valuable resources and full decontamination of the soils and groundwater in the USS Lead Superfund site.

Such a permanent solution requires U.S. EPA selection of <u>Remedial Action Alternative 4D</u> followed by <u>a combined system of treatment technologies to separate, reclaim & recycle, decontaminate, and restore both soils and groundwater</u> – one that actually reduces the volumes, mobility, and toxicity of toxic & hazardous contamination in our environment.

U.S. EPA cannot continue to ignore community input into the cleanup process and it is clear that the local community wants the most protective Remedial Action Alternative 4D selected by U.S. EPA as the remedy for this ROD Amendment.

Sincerely;

[redacted]
Hebron, IN 46341
[redacted]

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RE: Proposed Record Of Decision Amendment for the U.S. Smelter and Lead Refinery, Inc. Superfund Site in East Chicago, Lake County, Indiana– EPA ID: IND047030226

Hello Janet, Please find attached additional Written Comments on the Proposed Record Of Decision (ROD) Amendment for the U.S. Smelter and Lead Refinery, Inc. Superfund Site in East Chicago, Lake County, Indiana (USS Lead Superfund site).

It is apparent the U.S. EPA, relied upon their experience from previous and often earlier cleanups and has transferred and applied remedial activities such as Time Critical and Non-Time Critical Removal Actions and Final Remedies taken at contaminated Mining, Smelter, and Foundry sites elsewhere in the nation.

While there may be similarities to other sites, it is also apparent that there are significant differences between these sites and the actual situation in East Chicago, Indiana at the USS Lead Superfund Site, DuPont Site RCRA Corrective Action Site, and other sites found in or nearby the Calumet Community of East Chicago. In other words what was selected and completed at other Superfund and non-Superfund Sites by U.S. EPA elsewhere in the nation **does not** inevitably transfer–and may not be appropriate cleanup activities given the specific site conditions found in East Chicago, Indiana.

Significant differences include but are not limited to the following:

–Differences in local weather precipitation events; Site soils; Site geology; and Site hydrogeology–including the constantly fluctuating unconfined water-table of the Quartz Sand Calumet Aquifer which is directly and hydraulically connected to Lake Michigan - a public drinking water source–that has minimal ability to contain migrating toxic contaminates and rises and falls like a pumping mechanism dependent upon changes in the level of Lake Michigan and major weather precipitation events.

–Differences in the "species" or types of Contaminates found at specific Sites including differences in Water Solubility and Bioavailability of toxic contaminates (i.e. Inorganic forms of Lead found in Mining/Smelting/Foundry byproducts versus Lead & Arsenic Pesticide Formulations that were purposely designed to dissolve in water in order to be sprayed upon agricultural crops and also have high Bioavailability so as to be readily absorbed by and quickly kill living organisms–insect pests) known to be produced by several manufacturers of primary metal products and pesticides in East Chicago.

–Differences in U.S. EPA's Interim Remedial Action, Interim Removal Action and Interim Record of Decision (ROD) choices as well as selection of Final RODs and Final Remedy decisions at the compared sites. This is especially true for the intensity and particular details of community engagement in Public Health Screening, Public Health Education, and Environmental Monitoring efforts funded by U.S. EPA as compared to other Sites. And also includes differences in both temporary and permanent voluntary Relocations or Property Buyouts for contaminated residential, commercial, and/or institutional properties (e.g. businesses, churches, schools, etc.).

–Differences in specific Site Conceptual Models. U.S. EPA is more than willing to apply Smelter Stack Air Deposition models that were developed for Mining/Smelting/Foundry sites in its attempts to explain, in its entirety, the toxic contamination found in surface soils in East Chicago, Indiana... However, U.S. EPA constantly dismisses and ignores concerns of toxic soil contamination from solid wastes historically used as Fill Material that were transported from the last century of primary metal products and inorganic pesticides manufacturing in East Chicago–even though these contaminated wastes represent important Sources that are found in large quantities at the compared Sites.

–Differences in straightforward toxic metal exposure and health assessments from Mining/Smelting/Foundry byproducts (i.e. Arsenic, Cadmium, Lead, and Zinc) that are not directly applicable or equivalent to the high concentrations of both Inorganic and Organic Multiple Chemical Exposures such as: toxic Metals, Polycyclic Aromatic Hydrocarbons (PAHs), Volatile Organic Chemicals (VOCs), Polychlorinated biphenyls (PCBs), Pesticides, and/or Dioxin & Dioxin-like contaminate exposures experienced on a daily basis by the people living in East Chicago, Indiana.

It should be noted that even at the so-called "Superfund Mega Sites" for historic Mining/Smelting/Foundry cleanups, U.S. EPA has been heavily criticized for its selection of Interim Remedial Actions and Final Remedies with respect to both groundwater contamination and long-term effectiveness at the compared Sites:

"For environmental protection, EPA's site characterization provided a useful depiction of the metal concentrations in soils, sediments, and surface water over the large spatial scale in the basin.

However, the characterization did not adequately address groundwater—the primary source of dissolved metals in surface water—or identify specific locations and materials contributing metals to groundwater.

In addition, the committee has serious concerns about the feasibility and potential effectiveness of the proposed remedial actions for environmental protection.

There are no appropriate repositories to hold proposed amounts of excavated materials, and establishing them in the basin will probably be extremely difficult.

Furthermore, the potential long-term effectiveness of proposed remedial actions is severely limited by frequent flooding events in the basin and their potential to recontaminate remediated areas with contaminated sediments. Yet, flooding apparently received little attention in EPA's selection of remedies." –Lessons from the Coeur d'Alene River Basin' The National Academies Press, 2005

5. U.S. EPA is leaving vast quantities of toxic wastes within the community which constitutes improper land disposal by default. Given specific factors outlined above concerning Site specifics and proximity to Lake Michigan, it is clear there is no suitable land disposal site location to be found in East Chicago to stop the migration of contamination in soils and groundwater–Toxic Sources must be addressed completely.

U.S. EPA can and has incorporated very specific provisions in Interim and Final RODs.

Public Health Activities:

When U.S. EPA is made aware of impacts to children from contamination, usually Elevated Blood Levels (EBLs) for Lead, it mainly focuses on Removal Actions for contaminated surface soils and/or alternative drinking water supplies–it has also put very specific provisions for Public Health Actions in its formal decision documents.

U.S. EPA has chosen in Interim and Final RODs to supply residents in cleanup Sites with: bottled water delivery, under sink drinking water filtration units, whole house drinking water filtration units, and entire public drinking water distribution systems...

Other Public Health Actions in IRODs and RODs have specified ongoing activities until the Remedial Actions are completed and have included site-wide:

--Health information and education programs for residents including mass mailing (22,000 copies) of a community news letter devoted to lead awareness, health education, and lead poisoning prevention;

--Conducting lead awareness and education seminars in conjunction with pre-natal classes at local hospitals;

--Providing lead educational materials to schools, daycare centers, and the Parents As Teacher Association;

--Development and publication of a site-specific lead awareness and health education coloring book for distribution to pre-school children;

--Development of lead poisoning awareness curriculum in the local school district.

--Extensive or yearly blood-lead screening and in-home assessments of children and follow-up in the contaminated areas including door-to-door screening and distribution of educational material and a "comprehensive blood lead study" to be conducted two years and five years after the completion of the residential area Remedial Actions.

--Offsite blood-lead screening activities at local community events;

--Contacting local pediatricians to provide lead awareness and health educational information packets and encourage blood-lead screening in coordination with local area physicians;

~~-A~~ permanent EPA field office staffed on a full-time basis by a commissioned Public Health Service officer;

~~-~~Maintaining information booths at local health fairs held in shopping malls, schools, and hospitals;

~~-~~Development of a Lead Poisoning Prevention merit badge for the local Girl Scouts chapter

~~-~~Indoor Lead exposure evaluation programs;

~~-~~Contaminate exposure prevention information programs and special projects;

~~-~~Distribution of HEPA vacuum cleaners;

~~-~~Soil and/or drinking water testing programs; and

~~-~~Health Ordinances that will require soil testing and remediation of soils exceeding the risk-based cleanup standards in new residential construction.

Sampling and Environmental Monitoring:

During initial Remedial Investigations of contaminated Sites and in some cases "...**every year** to determine Basin-wide trends," U.S. EPA has sampled and analyzed environmental media including the following: "...surface and subsurface soil, sediment, surface water, groundwater, indoor and outdoor air, dust, tap water, garden produce, fish samples, biota, and paint chips..."

U.S EPA has recognized the potential health impacts from contaminated **Garden Crops**; "There are three main ways lead can contaminate garden crops; 1) by wind carried particles settling on vegetable surfaces, 2) vegetables directly contacting soil or soil splashing onto plants during watering or rain events, and 3) uptake into plants."

Waste Disposal in Groundwater:

U.S. EPA has recognized the need to remove toxic wastes disposed below ground in groundwater as an important in achieving a "long-term Remedy" at Sites: "Continued protectiveness of the remedy requires completion of sub-aqueous disposal removal activities..." and "The long-term remedy included sub-aqueous disposal to clean up mine wastes (OU2 and OU3)..."

Lead-based Paint:

Besides contaminated soil Removal Actions U.S. EPA has also performed or funded local Remedial Actions that include exterior Lead-based paint stabilization.

Comprehensive Cleanups Elsewhere:

U.S. EPA has completely removed and subsequently restored Site Infrastructure and Vegetation such as sidewalks, roads, and trees & shrubs during Remedial Actions at the compared Sites in order to better cleanup Site contamination...

U.S. EPA has removed the Sources of contamination or so-called "Principal Threat Materials" (PTMs) from the compared Sites but has refused to acknowledge, investigate, and remediate the Sources of contamination buried underground in East Chicago, Indiana.

Relocations:

U.S. EPA has undertaken but-outs and voluntarily relocation of entire communities including residents, businesses, and institutions from Sites, even after initial or interim remedial activities such as soil Removal Actions have been completed, and has done so with specific compensation provisions that are more favorable than the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970...

For example: "This relocation effort includes both residential and business properties. Any relocation of residents in Treece is not subject to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970"

U.S. EPA has even relocated Renter residents without delay: "Treece residents are eligible for voluntary relocation assistance regardless of property ownership. Renter relocation will be run concurrently with property owners to facilitate the quickest relocation of occupants for the Treece relocation area."

And U.S. EPA has facilitated local efforts to help with resident relocations including: "... a program to assist with the relocation of residents and businesses in the community of Treece, Kansas" and "...created a state public trust to administer relocation assistance to the citizens of Treece, Kansas."

Finally, U.S. EPA should make this ROD Amendment for the entire USS Lead Superfund Site based upon the knowledge and information learned since 2012.

This should include addressing contaminated dust & groundwater infiltrating people's homes, buried solid wastes, and relocating people and compensation at a level of what their property would be worth if no contamination was present.

Respectfully;

[redacted]
Hebron, Indiana 46341
[redacted]

RE: Follow-up on U.S. EPA's September 16, 2017 Public Meeting

Hello, please feel free to add anything you may have learned on to this list…

Specific things that I was told during the U.S. EPA's September 16, 2017 meeting:

1) That U.S EPA has to follow policies and guidance and that every community in the Superfund Program had to be treated the same;

2) That Arsenic is considered the primary pollutant in groundwater at the DuPont / Chemours Site;

3) That there will be Public Hearing and Comment Period on the Final RCRA Corrective Action for the DuPont / Chemours site in the near future;

4) That residents are experiencing incomplete and/or inconsistent Time-Critical Soil Removal Actions;

5)

Specific things I was told after the U.S. EPA's September 16, 2017 meeting:

1) The Time-Critical Soil Removal Action is the Final Remedy for the USS Lead Superfund Site;

2) That Risk Assessment was protective of the residents during the Removal Actions and that exposures due to tree or shrub removal or drinking water service line replacement that resulted from excavated soil was only temporary and was taken into account under the long-term risk assessment;

3) That DuPont had removed soil on-site that tested Characteristically as Hazardous Waste and reburied the waste in the On-site Landfill after mixing it with something that made it non-Hazardous and that this constituted treatment of the Hazardous Waste; (Note: This moved the toxic wastes closer to the Riley Park residential area…)

4)

Some information that highlights incomplete or misleading statements witnessed at U.S. EPA's September 16, 2017 meeting:

1) Anyone that takes the time to investigate other Superfund Sites, especially those where U.S. EPA has found Lead and other metals contamination such as mining and smelting facilities will quickly learn that no Superfund Site is the same and that U.S. EPA has offered many different outcomes to communities from what the situation is in East Chicago, Indiana; (For Example See: Tar Creek Superfund Site)

"Although the relocation program is costing less than expected, buyout offers were comparable with existing property outside the Superfund site and averaged a higher amount than a state-sponsored buyout for families with young children."

See: [http://www.tulsaworld.com/news/local/tar-creek-buyout-costs-less-than-expected/article_4839d406-4bbd-54ce-bf6a-79df2d3047d1.html] 'Tar Creek buyout costs less than expected – Tar Creek removal costs less than expected' by Omer Gillham, Tulsa World, December 19, 2010.

2) Arsenic is NOT the primary pollutant found in the groundwater as the RCRA Corrective Action Order for the DuPont site states:

"Inorganic constituents were detected in the shallow ground water at the Facility.

At a minimum, parameters detected in the ground water at elevated concentrations at the Facility include: arsenic, chloride, fluoride, iron, magnesium, manganese, nitrogen (both ammonia and TKN), phosphate, sodium, sulfate and zinc. Hazardous wastes or hazardous constituents in the ground water have been documented to be migrating south towards the Grand Calumet River, or north towards the Riley Park neighborhood in East Chicago. Using conservative assumptions, several of the constituents, including arsenic, barium, boron, calcium, chloride, phosphate, sulfate and zinc, exceed 1 percent of the total loadings of the Grand Calumet River.

Drinking water maximum contaminant levels (MCLs) for arsenic, barium, cadmium, fluoride and lead were exceeded in samples from various locations on the Facility. In addition, heavy metals contamination is present in the sediments and wetlands of the Grand Calumet River bordering the Facility, including the following: antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc.

Elevated organic constituents, including carbon disulfide, phenol, 1,1-dichloroethane, 1,2-dichloroethane, 1,1,1- trichloroethane, and chloroform were detected in the ground water. These hazardous wastes or hazardous constituents could potentially migrate south towards the Grand Calumet River, or north towards the sewers of the East Chicago Sanitary District in the Riley Park neighborhood. The concentration of 1,2-dichloroethane exceeded federal MCLs for drinking water at one site."

See: [https://www3.epa.gov/region5/cleanup/rcra/dupont/pdfs/dupont-east-chicago-corrective-action-order-199706.pdf] 'RCRA Corrective Action Order for the DuPont East Chicago Plant signed by DuPont June 17,1997' US EPA

See: [https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=80281236&dDocName=80280916&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=80280916.pdf] 'Corrective Action Order DuPont-East Chicago, IN IND005174254' US EPA, 1997.

3) My understanding is that the USS Lead Superfund Site has Operable Units with unresolved issues and incomplete remedies including Site-wide Groundwater so the Time Critical Soil Removal Action is NOT the Final Remedy for the USS Lead Superfund Site as per the Consent Decree and Record of Decision;

"Operable Unit 2 - The former USS Lead facility, its surrounding property, and site-wide groundwater. 0U2 will be addressed in a future RI/FS and decision document."

"...contamination still remains at the USS Lead property that requires further evaluation" and, "...some of the material that will be excavated and require disposal will be a hazardous waste; the corrective action management unit located within the USS Lead facility is not a hazardous waste landfill and cannot accept such wastes."

See: [https://semspub.epa.gov/work/05/446987.pdf] 'U.S. Smelter and Lead Refinery, Inc. Superfund Site Operable Unit 1 Record of Decision' U.S. EPA November 2012.

"L. The Site consists of two Operable Units: OU1 and OU2, both defined below. The Parties agree that the remedy for OU2 will be addressed separately at a later time.

M. OU1 consists of surface and subsurface soil within the geographic boundaries identified in the definition of OU1. OU1 does not include groundwater. The Parties agree that the remedy for groundwater associated with the Site will be addressed separately at a later time."

See: [https://semspub.epa.gov/work/05/919701.pdf] 'CONSENT DECREE RELATING TO RESPONSE ACTIONS AND RESPONSE COSTS IN ZONES 1 AND 3 OF OPERABLE UNIT 1 OF THE USS LEAD SITE' United States District Court Northern District of Indiana, Civil Action 2:14-cv-312, September 3, 2014.

4) Risk Assessment calculations are NOT an acceptable excuse for negligent work taking place in a Superfund Site that result in actual or potential exposures (acute or chronic) to Hazardous & Toxic substances. Workers and Residents must be protected from any additional exposures to Hazardous and/or Toxic contaminates during Removal and other remedial actions;

"Heavy rains may cause further migration of contaminants off site. Winds could cause dust particles containing heavy metals to continue to migrate into the surrounding community. These weather conditions could result in a continued release of the hazardous wastes described herein to the surrounding soil, air and surface water."

"Properly address any additional hazardous waste and/or materials identified during the removal action."

"Ensure that the proposed cleanup adequately protects human health, welfare, and the environment from the hazardous waste described in this Action Memo."

See: [https://semspub.epa.gov/work/05/286112.pdf] 'Request to Conduct a Time-Critical Removal Action at the residential portion of the USS Lead Site' U.S. EPA, January 22, 2008.

5) U.S. EPA's Mixture Rule makes it illegal to mix Listed Hazardous Wastes to avoid regulation under RCRA. I know of no Reactant that will render toxic metals at Characteristically Hazardous Waste concentrations non-Hazardous unless it simply is diluting and/or buffering the wastes so as to pass the Toxicity Characteristic Leaching Procedure (TCLP) for Land Disposal Facilities.

   Toxic Metals by their very nature are Elements that do not breakdown over time.

   Given the type of industrial processes operated at the DuPont / Chemours Site many of the wastes that were generated should be defined as Listed Hazardous Wastes regardless of their Characteristic Toxicity;

"Waste codes F001 - F005 apply to wastestreams from the use of certain common organic solvents."

"The listed wastes F020 - F023 and F026 - F028 are commonly known as the "dioxin-bearing wastes." These listings describe a number of wastestreams that EPA believes are likely to contain dioxins, which are considered to be among the most dangerous known chemical compounds. The dioxin listings apply primarily to manufacturing process wastes from the production of specific pesticides or specific chemicals used in the production of pesticides."

"The F039 listing applies to multisource leachate, the liquid material that accumulates at the bottom of a hazardous waste landfill."

In addition K Listed waste descriptions include particular wastes from specific industry sectors including: "organic chemicals manufacturing, inorganic chemicals manufacturing, and pesticides manufacturing..."

"The P and U listings apply to unused chemicals that become wastes. Unused chemicals become wastes for a number of reasons. For example, some unused chemicals are spilled by accident. Others are intentionally discarded because they are off-specification and cannot serve the purpose for which they were originally produced."

"The mixture and derived-from rules operate differently for listed waste and characteristic wastes."

"The mixture rule for listed wastes states that a mixture made up of any amount of a nonhazardous solid waste and any amount of a listed hazardous waste is considered a listed hazardous waste."

"If EPA relied solely on the narrative listing descriptions to govern when a waste ceased being hazardous, industry might easily circumvent RCRA's protective regulation. For example, a waste handler could simply mix different wastes and claim that they no longer exactly matched the applicable hazardous waste listing descriptions. These wastes would no longer be regulated by RCRA, even though the chemicals they contained would continue to pose the same threats to human health and the environment."

"A mixture involving characteristic wastes is hazardous only if the mixture itself exhibits a characteristic. Similarly, treatment residues and materials derived from characteristic wastes are hazardous only if they themselves exhibit a characteristic."

See: [https://www.epa.gov/sites/production/files/2015-09/documents/hwid05.pdf] 'Introduction to Hazardous Waste identification (40 CFR Parts 261)' U.S. EPA Solid Waste and Emergency Response Training Manual (5305W) EPA530-K-05-012, September 2005.

"Site-related constituents primarily include metals and a limited number of polychlorinated biphenyls (PCBs) and pesticides. The majority of these constituents are persistent in environmental media such as surface soils. No biodegradation of metals and little biodegradation of organic compounds will occur."

(Note: This report also includes photographs and exposure & risk characterizations of the various Solid Waste Management Units (SWMUs) and Areas Of Concern (AOC))

See: [https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=3359730&dDocName=31063811&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=31063811.pdf] 'DuPont EC Draft Screening-Level Ecological Risk Assessment May 3, 2004' DuPont Corporate Remediation Group

6)

Other things I have recently learned from U.S. EPA and IDEM Public Records:

1) That DuPont / Chemours / W. R. Grace in East Chicago, Indiana have never had a permit for their landfill that I have been able to find let alone a RCRA Hazardous Waste Landfill permit and also changed their Special Waste classification with IDEM from Class III to Class IV (Exempt);

2) That the DuPont landfill was suppose to undergo RCRA Closure in the late 1990's and that an Administrative Order was signed between DuPont and IDEM concerning Listed Hazardous Waste violations in East Chicago, Indiana;

"The modification being requested involves the replacement of the 12inch clay cover with a Geosynthetic Clay Liner (GCL)."

See: [
https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=3461687&dDocName=31050135&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=31050135.pdf]
'DuPont EC Modification of On-Site Landfill Closure Plan May 25 1999'

See: [
https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=80345263&dDocName=80344880&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=80344880.pdf]
'Interim Closure Plan DuPont Specialty Chemicals Lake County' IDEM, 1997.

DuPont "...stored hazardous flue dust and refractory brick waste (D007) restricted from land disposal for greater than two (2) years, in violation of 40 CFR 268.50" "...without obtaining a permit and complying with the technical storage facility requirements."

DuPont also "...failed to establish financial assurance for closure of the facility" and "...failed to demonstrate financial responsibility from claims arising from the operations of its facility from sudden and accidental occurrences that cause injury to persons or property."

See: [
https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=4175280&dDocName=65635343&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=65635343.pdf]
'DuPont Agreed Order H-12580' IDEM, December 7, 1998.

3) That DuPont was suppose to conduct three more rounds of groundwater and sump pump sampling in the Riley Park area and it was suggested that monitoring wells should be installed in the Riley Park area also;

See: [
https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=3358494&dDocName=31050184&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=31050184.pdf]
'DuPont EC US EPA Facility Workplan Comments January 21, 1999'

4) That DuPont had a Citizen Advisory Committee in 1990;

See: [
https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=3257076&dDocName=44214263&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=44214263.pdf]
'CH2M Hill DuPont January 14, 1991 Status Report and August 21, 1990 Technical Memorandum' IDEM

5) That 'Point Of Compliance' in meeting groundwater standards for monitoring wells is suppose to be on the boundary of the Waste Management Unit (WMU) not an arbitrary property boundary or fence line and that the farthest away it can be is 150 meters from that boundary due to obstructions;

See: [https://www.epa.gov/sites/production/files/2016-03/documents/subparte_0.pdf] 'Chapter 5 Subpart E – Ground-Water Monitoring and Corrective Action' U.S EPA, 2016.

See: [https://www.epa.gov/sites/production/files/2015-07/documents/gwm.pdf] 'RCRA, Superfund & EPCRA Call Center Training Module EPA530-K-02-010I' U.S. EPA, October 2001

See: [https://www.epa.gov/sites/production/files/2017-02/documents/gwhb041404.pdf] 'Handbook of Groundwater Protection and Cleanup Policies for RCRA Corrective Action for Facilities Subject to Corrective Action Under Subtitle C of the Resource Conservation and Recovery Act' EPA530-R-04-030, U.S. EPA, April 2004.

6) That even though DuPont East Chicago, Indiana originally declared itself as a Large Generator of Hazardous Waste with Treatment, Storage, and Disposal operations in 1980 it has apparently transformed itself into a Facility that no longer requires Permitting or RCRA Liability Coverage as IDEM released Chemours' East Chicago, Indiana IND005174354 Surety Bond LPM9109792 on May 26, 2017;

See: [https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=3028246&dDocName=32766560&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=32766560.pdf] 'DuPont EC August 1980 Notification of Hazardous Waste Activity'

"The Indiana Department of Environmental Management has determined that RCRA liability coverage is not required for this facility."

See: [https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=80467267&dDocName=80466607&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=80466607.pdf] 'Release of Surety Bond No. LPM9109792 DuPont Chemours RCRA Liability Coverage' Jeffery L. Sewell Deputy Assistant Commissioner Office of Land Quality IDEM, May 26 2017.

See: [
https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=80076801&dDocName=80077041&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=80077041.pdf]
'Transfer from DuPont to Chemours'

7) "According to DuPont the following wastes were disposed of on-site: Vanadium pentoxide; Antimony pentachloride; Calcium arsenate; Lead arsenate; Dichlorobenzene (degradation product of Linuron); Ammonium sulfamate; Sodium hydroxide; Calcium hydroxide; Arsenic trioxide" — U.S. EPA, July 2, 1980 Correspondence to Jerry Frumm, U.S. EPA, from Richard Shandross, Dupont, East Chicago, IN

See: [
https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=3221582&dDocName=47496697&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=47496697.pdf]
'Ecology and Environment Inc Preliminary Assessment October 24 1991' IDEM

8) That the DuPont RCRA Corrective Action Order required that; "The RFI Work plan shall be designed to define the presence, magnitude, extent, direction, and rate of movement of any hazardous wastes of hazardous constituents within and beyond the Facility boundary that are related to the Facility. The RFI Work plan shall document the procedures the Respondent [DuPont] shall use to conduct those investigations necessary: (1) to characterize the potential pathways of contaminate migration; (2) to characterize the source(s) of contamination; (3) to define the degree and extent of contamination; (4) to identify actual or potential receptors; and (5) to support the development of alternatives from which a corrective measure will be selected by U.S. EPA.";

https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=80281236&dDocName=80280916&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=80280916.pdf]
'Corrective Action Order DuPont-East Chicago, IN IND005174254' US EPA, 1997.

9) That DuPont "Groundwater Pool A" flows towards the Riley Park area and "...groundwater in the area exceeds antimony, arsenic, cadmium, vanadium, and zinc industrial screening levels and groundwater depth is 1 to 5 feet below ground surface (bgs)" and "off-site groundwater ranges from 2 to 7 feet below ground surface (bgs)";

See: [
https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=3358494&dDocName=31050184&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=31050184.pdf]
'DuPont EC US EPA Facility Workplan Comments January 21, 1999'

10) That DuPont estimated 24 gallons per minute of groundwater is infiltrating into the Riley Park sanitary sewer system and that "…sewers in the southern half of Riley Park intercept a portion of the groundwater flow migrating north from the DuPont facility";

See: [
https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=3358494&dDocName=31050184&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=31050184.pdf]
'DuPont EC US EPA Facility Workplan Comments January 21, 1999'

11)

Things that are obviously apparent:

1) The United States Environmental Protection Agency (U.S. EPA) and Indiana Department of Environmental Management (IDEM) and City of east Chicago, Indiana have allowed the unfettered and unpermitted land disposal of Hazardous, Toxic, and Special wastes to take place in the sandy soils and high water table of the Calumet Aquifer adjacent the Grand Calumet River and Lake Michigan for decades and it apparently continues today…

2) All of Northwest Indiana North of the Little Calumet River is generally unsuitable for any kind of waste disposal let alone land disposal of Hazardous, Toxic, and Special industrial wastes given the highly permeable sandy soils and 35 to 40 foot deep water table ground water aquifer which is dynamically connected to the level of the water in the rivers & canals and Lake Michigan. The Calumet Aquifer is found from 0 (near the rivers) to 8 feet deep throughout the area and its flow rate has been estimated to be capable of moving as fast as 13 feet per day…

3) In East Chicago, Indiana local Industry and the Army Corps of Engineers can do as they please and dump Hazardous & Toxic wastes by the millions of tons for years without permits into disposal sites that cannot meet current requirements

for siting, design, construction, operation, and/or closure of Land Disposal Facilities – this if not already, this should be considered criminal activity;

4) If the US EPA and IDEM were actually being protective of the people of the Calumet area they would be completely detoxifying the soils and groundwater by reclaiming & recycling toxic metals, doing the same thing or destroying toxic organic contaminates, and restoring clean living soils and uncontaminated surface & ground waters.

5) That in East Chicago, Indiana the local Industry and the Army Corps of Engineers are the ones actually making the decisions and deciding what remedial work will be done by controlling the process and the purse strings;

6)

ADDITIONAL INFORMATION

Wastewater (Effluent) often contains the same contaminates that may be released into the air or disposed of as solid wastes and U.S. EPA Development Documents for Effluent Limitations Guidelines and Standards detail Pollutants Known To Be Present – this information can be found in the following documents…

See: [https://www.epa.gov/sites/production/files/2017-04/documents/pesticide-chemicals-mfg_dd_1993.pdf] 'DEVELOPMENT DOCUMENT FOR EFFLUENT LIMITATIONS GUIDELINES, PRETREATMENT STANDARDS, AND NEW SOURCE PERFORMANCE STANDARDS FOR THE PESTICIDE CHEMICALS MANUFACTURING CATEGORY' U.S. EPA, EPA-821-R-93-016, September 1993. (Page 5-22 through 5-27 discusses Priority Pollutants Known to be Present)

See: [https://www.ecfr.gov/cgi-bin/text-idx?SID=9b2ad535d533c8e67ed84ba64ff900de&mc=true&node=pt40.31.415&rgn=div5] 'PART 415—INORGANIC CHEMICALS MANUFACTURING POINT SOURCE CATEGORY' Code of Federal Regulations

"The 1989 Development Document (10 volumes) is a consolidation of all BAT Phase I & II revisions:

1. General
2. Bauxite Refining, Primary Aluminum Refining, Secondary Aluminum Refining

3. Primary Copper Smelting, Primary Electrolytic Copper Refining, Secondary Copper, Metallurgical Acid Plants
4. Primary Zinc, Primary Lead, Secondary Lead, Primary Antimony
5. Primary Precious Metals and Mercury, Secondary Precious Metals, Secondary Silver, Secondary Mercury
6. Primary Tungsten, Secondary Tungsten & Cobalt, Primary Molybdenum & Rhenium, Secondary Molybdenum & Vanadium
7. Primary Beryllium, Primary Nickel and Cobalt, Secondary Nickel, Secondary Tin
8. Primary Columbium-Tantalum, Secondary Tantalum, Secondary Uranium
9. Primary and Secondary Titanium, Primary Zirconium & Hafnium
10. Primary and Secondary Germanium & Gallium, Primary Rare Earth Metals, Secondary Indium"

See: [https://www.epa.gov/sites/production/files/2015-10/documents/ocpsf_tdd_1987_vol1.pdf] 'DEVELOPMENT DOCUMENT FOR EFFLUENT LIMITATIONS GUIDELINES NEW SOURCE PERFORMANCE STANDARDS AND PRETREATMENT STANDARDS FOR THE ORGANIC CHEMICALS AND THE PLASTICS AND SYNTHETIC FIBERS POINT SOURCE CATEGORY Volume I' U.S. EPA, EPA_440/1-87/009, October 1987.

See: [https://www.epa.gov/eg/nonferrous-metals-manufacturing-effluent-guidelines-documents-1990-amendment] 'Nonferrous Metals Manufacturing Effluent Guidelines Documents for 1990 Amendment' U.S. EPA

See: [https://www.epa.gov/sites/production/files/2015-11/documents/landfills-eg_dd_2000.pdf] 'Development Document for Final Effluent Limitations Guidelines and Standards for the Landfills Point Source Category' U.S. EPA, EPA-821-R-99-019, January 2000.

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See: [https://www.epa.gov/in/hazardous-waste-cleanup-dupont-facility-east-chicago-indiana] 'Hazardous Waste Cleanup DuPont Facility East Chicago, Indiana'

See: [https://www.epa.gov/sites/production/files/2017-09/documents/dupont-presentation-9-16-17.pdf] 'DuPont East Chicago Site RCRA Corrective Action Program' Jennifer Dodds RCRA Project Manager, EPA Region 5, September 16, 2017.

(Note: This is not a complete listing of all of the public records available from U.S. EPA or IDEM... These Links are listed from oldest to latest dates...)

See: [https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=3028246&dDocName=32766560&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=32766560.pdf]
'DuPont EC August 1980 Notification of Hazardous Waste Activity'

"CH2M Hill identified 36 known or suspected Waste Management Units (WMUs) on plant property with assistance from DuPont personnel."

See[https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=3555218&dDocName=58310405&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=58310405.pdf]
'DuPont EC Groundwater Assessment Phase I CH2M Hill February 1990' IDEM

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'DuPont EC Groundwater Assessment Phase I February 1990'

See: [https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=3155908&dDocName=42633721&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=42633721.pdf]
'DuPont EC Public Meeting Concerning Groundwater Quality March 28, 1990' (Note: This presentation shows the groundwater moving south (in the wrong direction) for the north portion of the site.)

See: [https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=3257076&dDocName=44214263&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=44214263.pdf]
'CH2M Hill DuPont January 14, 1991 Status Report and August 21, 1990 Technical Memorandum' IDEM

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'DuPont EC IDEM Hazardous Waste Management Compliance Evaluation – Inspection 7-26-1996'

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'DuPont EC QAPP for RCRA Sediment Characterization Study 11-26-1997'

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'DuPont EC SOP Validation of Metals Data 1-3-1998'

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'DuPont EC RCRA Facility Investigation Work Plan March 9, 1998' (Note: See pages 54 through 58 for map of site hydrology and groundwater flows.)

See: [
https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=3373154&dDocName=31047519&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=31047519.pdf]
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'DuPont EC Quality Assurance Project Plan for the RCRA Sediment Characterization Study April 23, 1998 Revision 1'

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'DuPont EC Quality Assurance Project Plan for the RCRA Sediment Characterization Study July 31, 1998 Revision 1 (Part 1 of 2)'

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'DuPont EC Quality Assurance Project Plan for the RCRA Sediment Characterization Study July 31, 1998 Revision 1 (Part 2 of 2)'

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'DuPont EC Project management Plan Appendix A December 31, 1998'

"14. DuPont "Groundwater Pool A" AOC (Pool A) hazard categories are ranked either "low" or "very low or none," even though groundwater in the area exceeds antimony, arsenic, cadmium, vanadium, and zinc industrial screening levels and groundwater depth is 1 to 5 feet below ground surface (bgs)."

"16. DuPont's "groundwater pool" concept does not address the source of contaminates that has been detected in groundwater and it appears that this concept conflicts with the Phase I RFI goals presented in Section 1.2."

19. (Excerpted) "In addition, DuPont states in the CCR [Current Conditions Report] that "few residents, if any, have direct contact with groundwater within the potentially affected area." However, also in the CCR, DuPont states that groundwater and surface water may be hydraulically connected in the Riley Park area, because off-site groundwater ranges from about 2 to 7 feet below ground surface (bgs). DuPont's one-time sewer manhole sampling event at Riley Park does not provide enough data to support the conclusion that few residents have direct contact with groundwater. Without further data to support this conclusion, it is unclear what potential effect groundwater may have on Riley Park residents. DuPont should provide additional data in the RFI work plan on the role that groundwater may have on Riley Park residents and on the amount of groundwater that may be infiltrating into the Riley Park sanitary sewer system."

Section 2.4.4, Page 2-19, Paragraph 2 (Excerpted) "DuPont's one-time sampling event is insufficient to determine if organic compounds are infiltrating into Riley Park residents' sump pump systems; therefore, DuPont should consider collecting additional water samples from the sump pump systems three more times per year or install groundwater monitoring wells within the Riley Park area and revise the RFI work plan accordingly."

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'DuPont EC Facility investigation Work Plan – Action Table March 31, 1999'

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'DuPont EC Revised Facility RFI Workplan and QAPP Comments by US EPA September 3, 1999'

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'DuPont EC US EPA Phase I Workplan and QAPP Approval October 8, 1999'

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"Site-related constituents primarily include metals and a limited number of polychlorinated biphenyls (PCBs) and pesticides. The majority of these constituents are persistent in environmental media such as surface soils. No biodegradation of metals and little biodegradation of organic compounds will occur."

(Note: This report also includes photographs and exposure & risk characterizations of the various Solid Waste Management Units (SWMUs) and Areas Of Concern (AOC))

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'DuPont EC SWMU and AOC Location Map with PRB Location Shown'

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'DuPont EC Phase II RFI SWMU & AOC Surficial Soil Screening Sample Locations'

See: [
https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=3250396&dDocName=43349789&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=43349789.pdf]
'DuPont EC Phase II RFI SWMU & AOC Surficial Soil Sample Location Map'

See: [
https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=3171517&dDocName=43350646&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=43350646.pdf]
'DuPont EC Phase II RFI SWMU & AOC Surficial Soil Sample Locations'

See: [
https://ecm.idem.in.gov/cs/idcplg?IdcService=GET_FILE&dID=3221204&dDocName=43350814&Rendition=web&allowInterrupt=1&noSaveAs=1&fileName=43350814.pdf]
'DuPont EC Phase II RFI Characterization Assessment Summary'

July 27, 2017

To: Mr. Albert Kelly
Senior Advisor to the Administrator
Office of the Administrator
United States Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460
(202) 564-5086
(202) 306-8830
< kelly.albert@epa.gov >

From: [redacted]
Hebron, Indiana 46341
[redacted]

RE: July 15, 2017 Indiana Harbor CDF & USS Lead Superfund Meetings

Dear Mr. Kelly,

I want to personally thank you for enduring the five hours of toxic tribulations you witnessed Saturday July 15, 2017 in East Chicago, Indiana. This correspondence is entirely my own as a concerned taxpaying citizen I am not representing an organization.

I hope that you realize as I do that Superfund is broken and is failing to protect people of the United States from toxic wastes and their adverse health impacts.

In East Chicago we see the generational damage that chronic toxic waste exposure has produced. A community of color where children evacuated from one school built on the USS Lead Superfund site are relocated to a school that is one-third of a mile from where the United States Environmental Protection Agency (US EPA) and the United States Army Corps of Engineers (USACE) are creating the largest Dioxin & Polychlorinated biphenyl (PCBs) land disposal facility in the Great Lakes – most likely a future toxic waste Superfund site for Northwest Indiana...

I would like to provide you with some background on topic starting with the USS Lead Superfund site.

The ancient Greeks recognized Lead and Arsenic as poison over 2,200 years ago – anyone involved in this industry in East Chicago, Indiana saying that they did not know the hazards and risks of Lead and Arsenic are being deceitful…

The State of Indiana first discovered Lead contamination in 1985 with sample results with Lead levels "as high as 594,420 mg Pb/g (ppm)" parts per million (ppm) – in other words, over half Lead content in the soil off-site of the USS Lead Refinery's property.

This was followed up with sampling by US EPA which confirmed extremely high levels of Lead in the soil of the West Calumet area of East Chicago, Indiana.

In 1989 representatives for USS Lead Refinery signed a Partial Interim Agreed Order in Cause No. N-296 Indiana Department of Environmental Management (IDEM) versus USS Lead Refinery.

The Agreed Order required the company to conduct sampling and analysis for: "…all contaminated areas to determine the extent, area, and depth of contamination" and implement a cleanup plan that: "addresses what remedial action will be performed to ensure the removal of all contamination."

Today the US EPA, HUD, and the responsible parties are not providing anything close to what the company originally agreed to do in 1989.

All the decision making surrounding the USS Lead Superfund site has only been based upon what was considered a toxic particulate aerial deposition contamination event as a result of Lead smelting and alloying process smoke stacks and toxic dust from waste piles blowing with the wind…

We know that the West Calumet Housing Complex has extremely high levels of Lead in soil and inside homes with test results at 92,000 ppm Lead and 32,000 ppm Lead respectively. And we know the ground water there tests at 16,000 ppm Lead.

We know that millions of tons of Lead products were produced over the decades by the Lead industry operating in East Chicago, Indiana and that subsequently production of toxic wastes in the forms of dusts, slag, and dross were also generated by the millions of tons over time.

This toxic waste was dumped in nearby swamp – dune and swale topography consisting of twenty to thirty foot tall heavily vegetated sand dunes separated by low areas (swale) of wetlands similar to what can still be observed in nearby natural areas.

US EPA and the United States Department of Housing and Urban Development (HUD) have not identified where the millions of tons of these toxic wastes are located even though historical photographs clearly illustrate the land filling of the area over time.

Groundwater sampling is planned by US EPA without yet having identified any source(s) of contamination which is required to properly design a valid groundwater model and sampling plan. This is a waste of resources since we already know the groundwater at West Calumet tested at 16,000 ppm Lead. Sources of contamination must be identified first and a properly designed groundwater sampling and analysis plan needs to be implemented.

Currently US EPA and HUD plan to pay contractors to dig up the USS Lead Superfund site in the West Calumet Housing Complex three times:

1) Contractors paid to remove and stockpile contaminated soil during utility removal,
2) Contractors paid to replace the contaminated soil back into the utility excavations, and
3) Contractors paid to remove up to two feet of contaminated soil or implement some other interim or final remedy as selected by US EPA.

All these U.S. taxpayer dollars spent and contractor activity taking place on a toxic waste Superfund site and we still will not achieve any permanent remedy or complete cleanup of West Calumet. This is an outrageous squandering of tax dollars!

How many times does the federal government have to pay contractors to dig in the toxic soils found in the USS Lead Superfund site before we actually get a complete cleanup?

In fact, the money spent so far in not achieving a permanent remedy could have provided an equitable and just means for churches, businesses, property owners, and renters to move as a community to a clean & healthy area away from the USS Lead Superfund site.

Parallels between the infamous Love Canal toxic waste catastrophe In New York and the USS Lead Superfund site in Indiana include:

1) Residents are unaware of living on top of or adjacent to toxic wastes;

2) Children chronically exposed to contaminated dusts, soils, and waters;
3) Toxic waste contamination in schools, parks, and playgrounds;
4) Severely contaminated groundwater is documented and toxic contaminates are seeping into basements and drainage systems;
5) A portion of the Superfund site was forced to evacuate while other people are forced to remain behind in a known toxic waste contaminated environment;
6) Residents are told that it is safe to remain during demolition and emergency removal actions and are given false impressions of a permanent cleanup and restoration of their properties.

US EPA contractors are involved in an Emergency Removal Action only removing soil down to two feet deep at residences and parks. However US EPA in local public meetings speak of "Cleanups" and "Restoration" when in reality the Emergency Removal Action entails leaving areas under: sidewalks, patios, shrubs & trees, etc. unaddressed and ignores areas of visible contamination e.g. large chunks of slag found in parks and yards that are subsequently reburied by topsoil and sod even though visible contamination removal is required in USS Lead Superfund site's consent decree.

The lessons learned at the Love Canal and Tar Creek Superfund sites seem to have been lost and forgotten when it comes to East Chicago, Indiana.

No one in the United States of America should have to live on a toxic waste Superfund site.

The Superfund Amendments and Reauthorization Act (SARA): SARA requires U.S. EPA to give preference to and use permanent solutions and alternative treatment technologies "to the maximum extent practicable" with "reductions in volumes, mobility, and toxicity" of the wastes.

The only sure way to ensure toxic waste risk reduction is to eliminate the hazard.

And the only sure way to eliminate toxic waste liabilities for both the responsible parties and the community is to achieve a permanent cleanup. You might ask how clean?

"Moving hazardous waste from one hole in the ground to another is the non-solution that was behind SARA's preference for permanent cleanup." – U.S. Congress, Office of Technology Assessment (OTA)

"OTA considers that a site has been permanently cleaned up when the contamination that was the cause of high enough risk to warrant cleanup (either current or future risk) is rendered irreversibly harmless through destruction (e.g., incineration or biological treatment) or recovery and reuse of the hazardous substances (e.g., recovery of lead from contaminated soil and buried battery casings)" – U.S. Congress, Office of Technology Assessment

"Cost-benefit thinking allows nearly any kind of cleanup decision to be rationalized and undermines the environmental goals of Superfund. Cost-benefit reasoning backs up the selection of impermanent remedies because of excessive flexibility in cleanup goals." – U.S. Congress, Office of Technology Assessment

"Impermanent remedies results in: "Spending on cleanup remedies which are unlikely to be permanent, leading to more spending in the long term for re-cleanups and perhaps posing exposures, risks, and damage to health and environment." – U.S. Congress, Office of Technology Assessment

"...certain kinds of action are inconsistent with permanence, including any form of land disposal or containment, and any use of engineering or institutional controls, including long term monitoring for releases. All of these mean:

1) Site hazardous material remains hazardous;

2) There is uncertainty about releases of hazardous material and, therefore, risks to health and environment; and

3) There are a host of uncontrollable possible future events which might compromise the effectiveness of the protection.

"...OTA disagrees with the notion that land disposal or engineering or institutional controls provide a "degree of permanence." What varies is the level of protection provided by different cleanup technologies and methods, not the degree of permanence. To tell the public that a remedy is permanent for perhaps a decade does not build public confidence." – U.S. Congress, Office of Technology Assessment

Our government must provided an equitable and just means for churches, businesses, property owners, and renters to move as a community to a clean & healthy area away from the USS Lead Superfund site based upon the needs of the community.

Select a permanent remedy that ensures unrestricted and safe use of the land in the future – that will actually be a complete cleanup and restoration of the land and groundwater.

By comparison look what US EPA did in Pitcher, Oklahoma, at the Tar Creek Superfund site where "…EPA and the state of Oklahoma agreed to a mandatory evacuation and buyout of the entire township. The similarly contaminated satellite towns of Treece, Kansas and Cardin, Oklahoma were included in the Tar Creek Superfund site."

"EPA/HUD Joint Statement on the Picher, Oklahoma, Housing Authority
Release Date: 01/26/2009
Contact Information: Dave Bary or Anthony Suttice at 214-665-2200 or < r6press@epa.gov >

(Dallas, Texas – January 26, 2009) Officials of the Regional offices of the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Housing and Urban Development (HUD) are working together to ensure that families living in the Picher area are not adversely affected by the Tar Creek Superfund site. EPA and HUD support the voluntary relocation of residents currently under way."

Metal Smelters are always a concern due the nature of the toxic wastes produced by smelting and alloying processes. The people within the Tar Creek Superfund site were bought out but where toxic metal was smelted and alloyed in East Chicago, Indiana people have been left behind to suffer more chronic exposures to toxic wastes…

When a person can safely grow a garden without worry about being poisoned and feed themselves and their family then it's clean enough.

When a person can safely drill a well without worry about being poisoned and use that source of fresh water safely then it's clean enough. This level of clean also would ensure that any basements with water seepage would be free from toxic contamination.

With respect to the Indiana Harbor and Canal (IHC) dredging operations and Indiana Harbor Confined Disposal Facility (CDF) operations the phrase: "making matters worse" comes to mind…

Once again we see federal contractors involved in an impermanent removal action and failing containment strategy involving toxic wastes which are untreated and open dumped into a land disposal facility that does not meet current federal and state laws and regulations for: Siting, Design, Construction, or Operation of a Toxic Substances Control Act (TSCA) chemical landfill.

We are witnessing the next toxic waste Superfund site being created before our own eyes and it does not begin to eliminate toxic threats to public health here in Northwest Indiana in fact it adds more Risk to adults and children who's health is already in jeopardy with a 310 in one million cancer risk due to current levels of pollution…

US EPA's normal acceptable risk level is 1 in one million cancer Risk.

Commonsense would tell you that a single toxic volatile chemical could not possibly represent the vast number of hazards and risks known to be present in the heavily contaminated toxic Dioxin & PCB laced IHC sediments that are being dredged up by the United States Army Corps of Engineers (USACE) and then open dumped one third of a mile from schools, parks and residences in East Chicago, Indiana.

These toxic sediments have been describe as; "among the most contaminated and toxic that have ever been reported."

And as ridiculous as it may sound, that single chemical is: Naphthalene, commonly known as traditional mothballs – a solid white crystalline chemical that has vapors heavier than air and evaporates very slowly making it less likely to be detected given the way USACE is conducting their single chemical air pollution monitoring.

One definition of "mothball" is: "a state of having been rejected for further use or dismissed from further consideration."

That definition precisely describes how people's concerns over further poisoning of their community are being dismissed from consideration by USACE, US EPA, and the Indiana Department of Environmental Management (IDEM).

The USACE has failed for over four decades to come up with anything better than dredging up heavily contaminated toxic waste laced with Dioxin & PCBs and open dumping it next to schools, parks and residences – something that if anyone else did would make themselves subject to criminal prosecution under the law.

The fraudulent scheme USACE and US EPA are using considers the hazard and risk posed by mothballs alone in calculating an "Acceptable Risk" to people's health – this is not representative of all the Risks in the highly contaminated toxic IHC sediments.

And Real Time Monitoring only for mothballs ensures that the true extent of the releases of toxic volatile chemicals, including Dioxin & PCBs, during dredging, debris separation, and disposal operations will never be adequately monitored or reported to the public.

Commonsense tells you that the real hazards and risks are far greater than just mothballs and that current operational practices are far from being acceptable for the heavily contaminated toxic Dioxin & PCB sediments being disturbed and dumped.

Real Time Monitoring must use state-of-the-art technology which is capable of monitoring for all toxic volatile chemical air pollution during dredging and disposal operations to ensure protection of public health and safety in Northwest Indiana.

As opposed current uncontrolled open air practices, heavily contaminated debris separation and toxic sediment handing must take place in an enclosed process that ensures zero discharge of toxic volatile chemicals into Northwest Indiana's air.

Current USACE plans include leaving 45% to 55% of the most heavily contaminated Dioxin & PCB sediments exposed in place in the IHC after dredging and covering with a gravel cap. The PCBs will still be in the water column as they volatize from the highly contaminated exposed sediments which are now destabilized by incomplete dredging.

To stop the release of these toxins into Lake Michigan all of heavily contaminated toxic Dioxin & PCB IHC sediment must be dredged to a clean bottom for the entire IHC regardless of the extent of USACE's navigational boundaries. The USACE started this process and now must own the situation they have created in making matters worse by destabilizing toxic sediments in the IHC and increasing the spread of toxins into our air, water and land.

All debris and toxic sediments must be detoxified before land disposal to eliminate future toxic liability for both the polluting companies and the community's health – combinations of technologies to effectively do this have been around for decades (but due to length of this correspondence that is a subject for another discussion…).

Sincerely;

(b) (6) [redacted]
Hebron, Indiana 46341
(b) (6) [redacted]
(b) (6) [redacted]

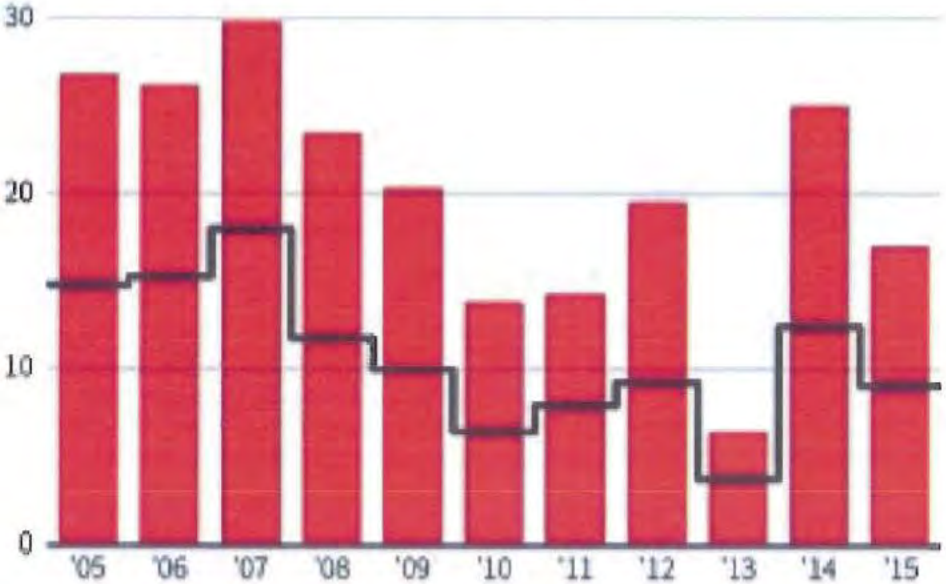
P.S. More details or references for any above information are available upon request.

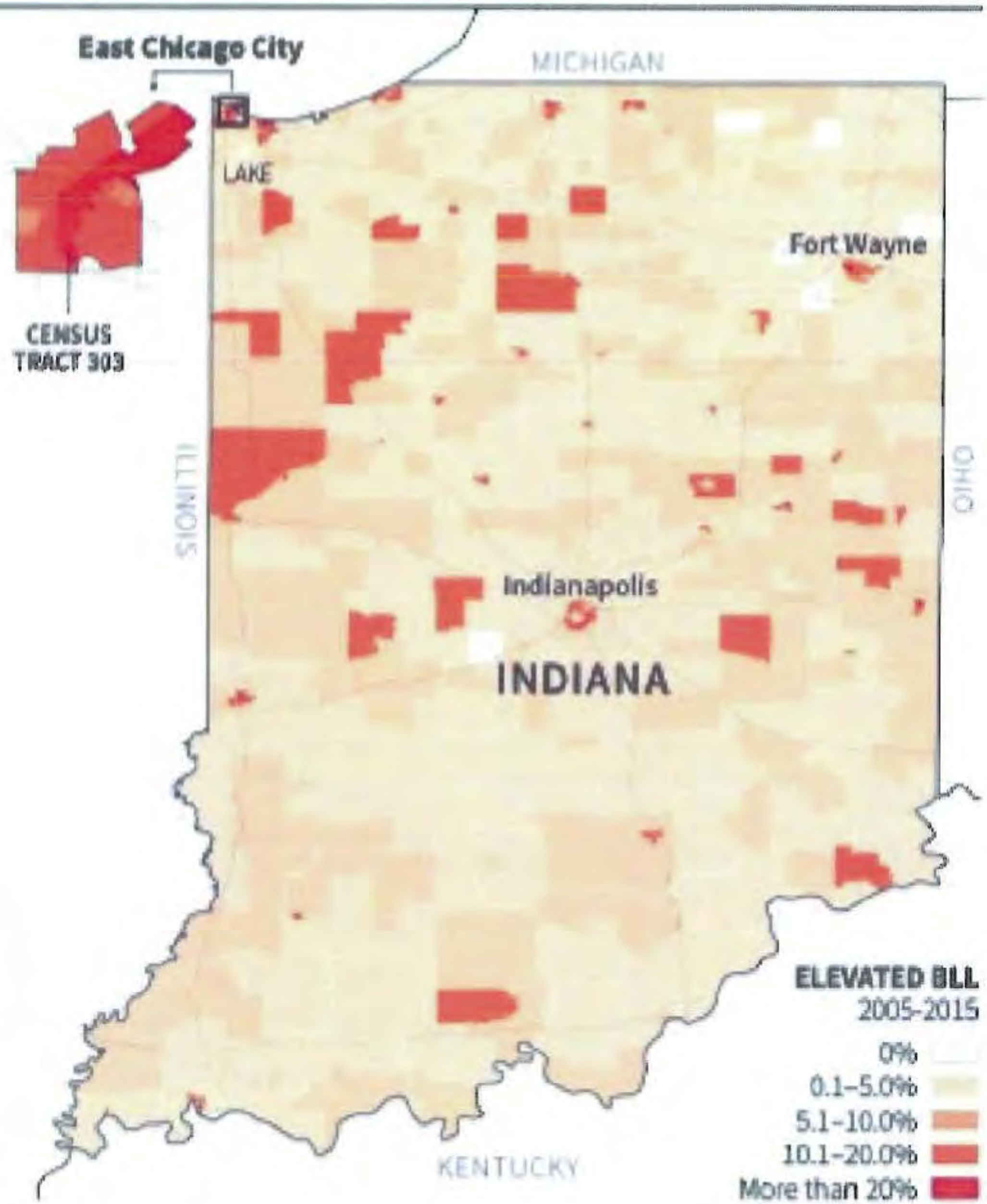
A neighborhood and lead

Five years ago a branch of the Centers for Disease Control and Prevention (CDC) said it believed children living in a Superfund site in East Chicago were "no longer exposed to lead from any source." But a Reuters analysis of state blood testing data found that, from 2005 through 2015, nearly 22 percent of children tested in a residential area of the Superfund site had elevated lead levels. That's many times higher than the national rate, and more than twice as high as in other East Chicago census tracts.

ELEVATED BLOOD LEAD LEVEL (BLL)

Percentage of children tested





Note: The 2011 Agency for Toxic Substances and Disease Registry report based its comparison on an elevated blood lead level of 10 micrograms per deciliter of lead in blood. Reuters made all of its comparisons based on five micrograms per deciliter of lead in blood because that is the level the CDC currently recommends triggering a public health response. The census tract containing the West Calumet Housing complex has a high percentage of children with elevated lead levels compared to the rest of the country, the state and nearby census tracts.

Source: Reuters analysis of Indiana State Department of Health capillary and venous blood lead level results

C. Chan, M. Pell 23/09/2016 SOURCE [redacted] (b) (6)

REUTERS

(b) (6)

[redacted]

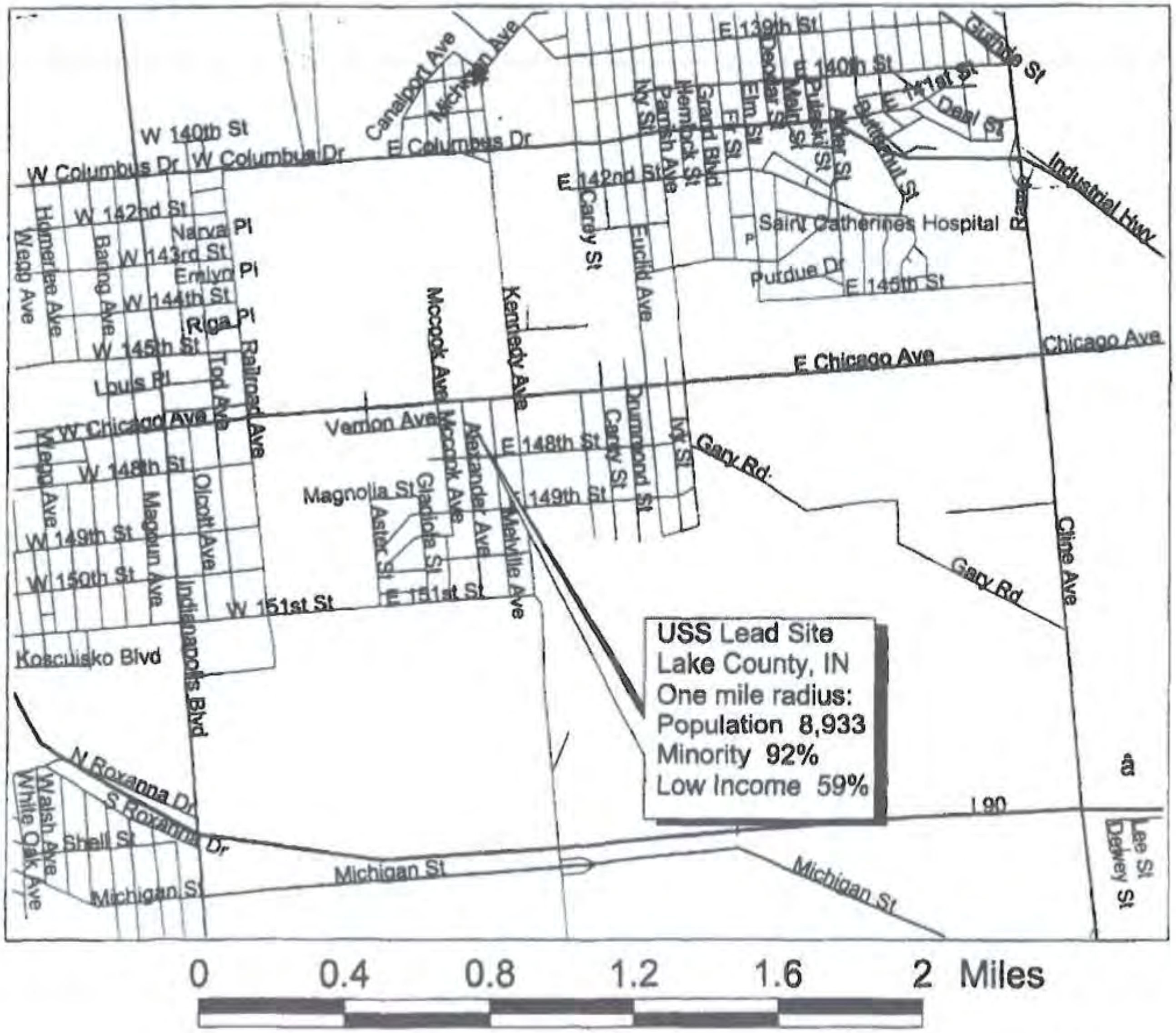
(b) (6)

[redacted]


Google, DigitalGlobe, IndianaMap Framework Data, Landsat / Copernicus, U.S. Geological Survey, USDA Farm Service Agency

Region 5 Superfund EJ Analysis

USS Lead Site East Chicago, IN



State of Indiana averages:
Minority: 14%
Low Income: 29%

U.S. EPA Region 5
Environmental Justice Case Criteria
for State of Indiana

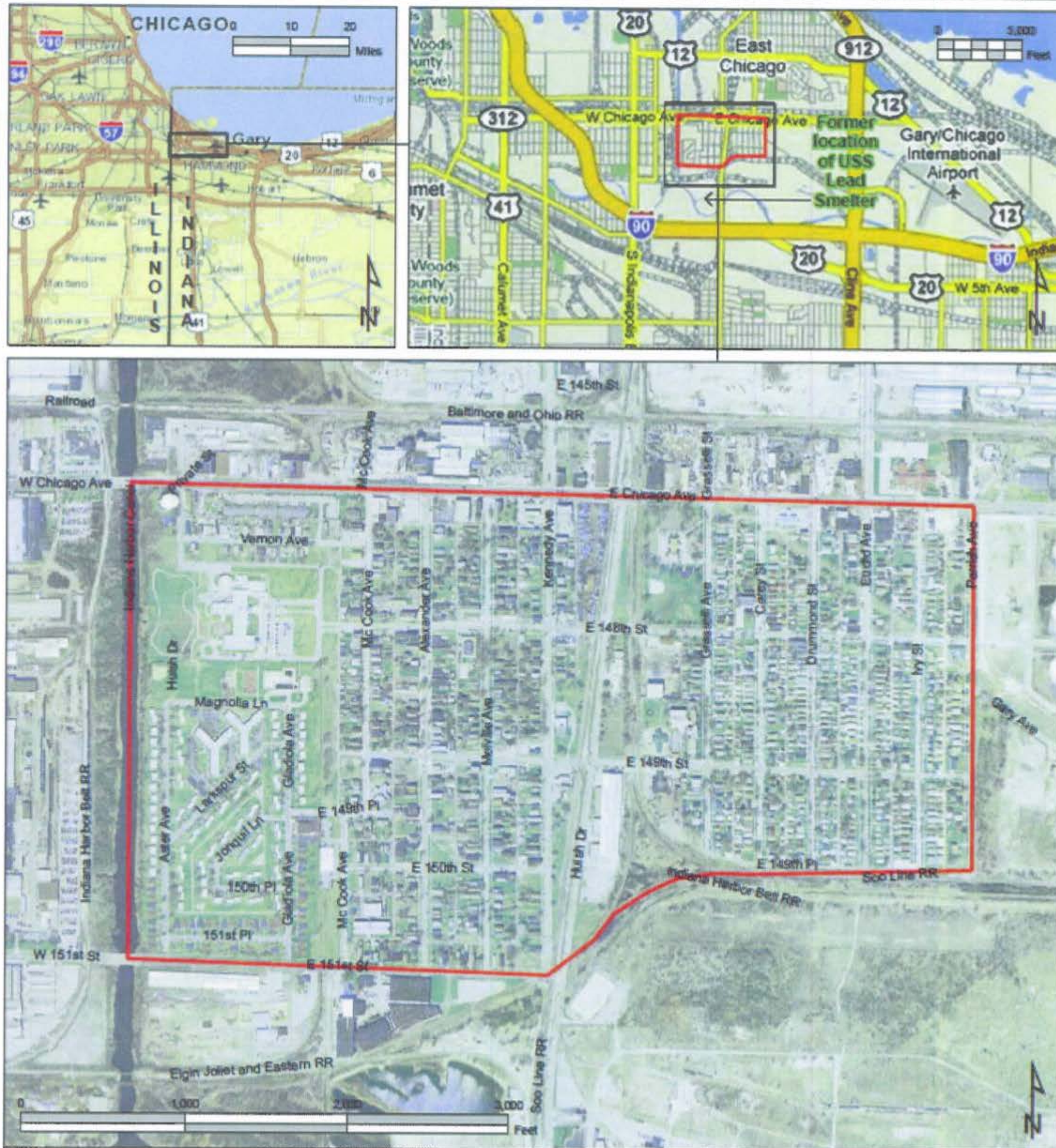
Minority: 28% or greater

Low Income: 58% or greater

Date of Map: 10/6/05

Source of Map: Census 2000 Database/ ArcView 3.0

FOIA EPA-R5-2022-005742



OU-1 boundary

Imagery sources (clockwise from upper left):
ESRI Resource Center
Google Maps
ISDP (Indiana Spatial Data Portal)

US SMELTER & LEAD REFINERY
LAKE COUNTY, EAST CHICAGO, INDIANA

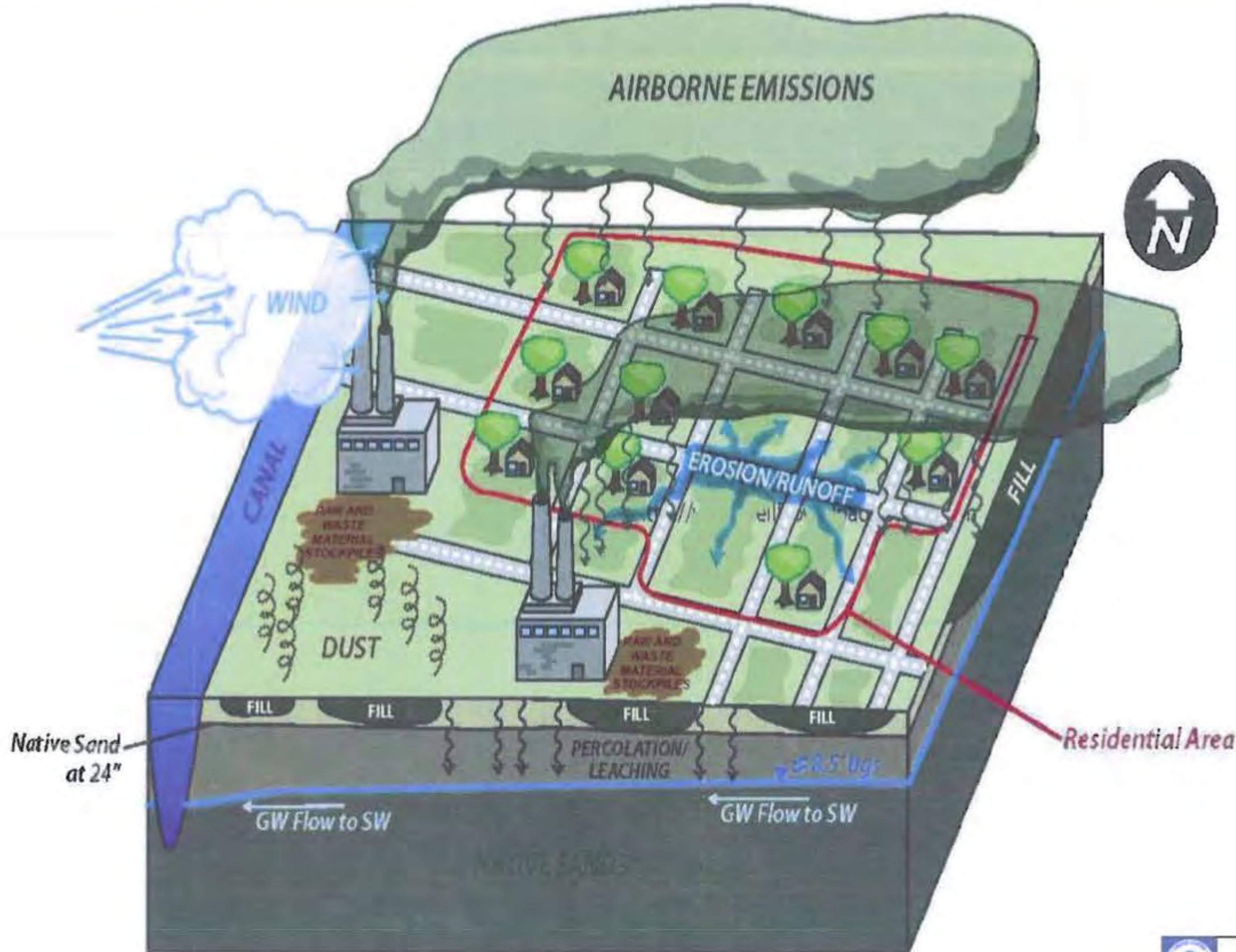
REMEDIAL INVESTIGATION REPORT

FIGURE 1-1
USS LEAD RESIDENTIAL AREA
SITE LOCATION MAP

EPA REGION 5 RAC 2 | REVISION 0 | JUNE 2012

ST SulTRAC

OU1 Residential Zones



US SMELTER & LEAD REFINERY
LAKE COUNTY, EAST CHICAGO, INDIANA
REMEDIAL INVESTIGATION REPORT
FIGURE 6-1
CONCEPTUAL SITE MODEL
EPA REGION 5 RAC 2 | REVISION 0 | JUNE 2012
ST SulTRAC

EPA Lead RI/FS

- Aerial Deposition of Lead
- Former Anaconda Operations at Public Housing Area
- Contamination Isolated to Fill Layer
  - Native Sands ~2 feet bgs
- Yards: 47% Require Remediation

The West Calumet Housing Complex in East Chicago.

Jonathan Miano, The Times


ASTER
Brandenburg
30353

A century of Toxic pollution in soil, household dust, and groundwater have resulted in generations of people being poisoned and suffering adverse health effects…

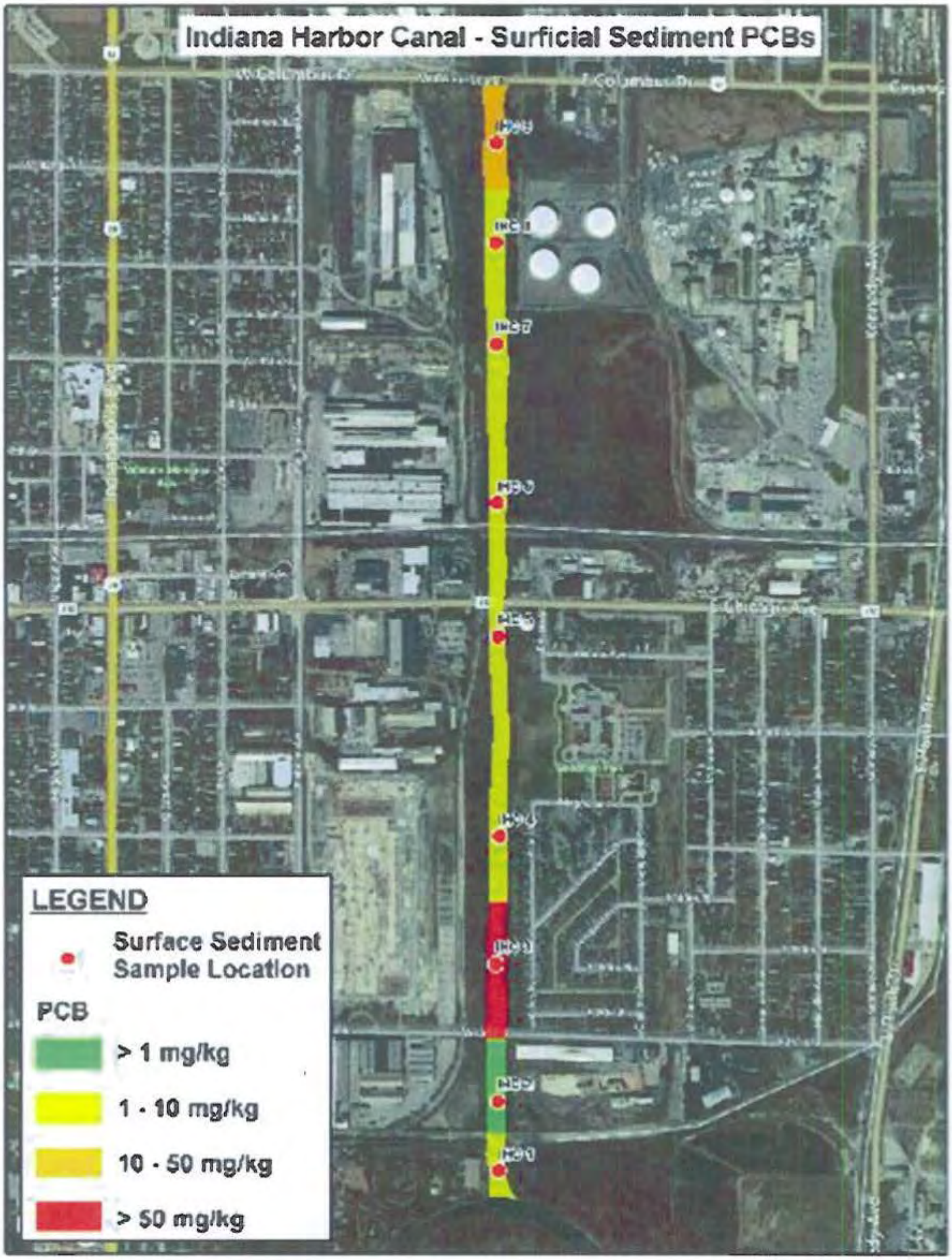
… the lead concentration in the fi… fraction. We are most concerned about the exposure of young children to the fin… fraction, so those values are compared to EPA's health screening level. The concentrations of lead and arsenic detected in your home are above EPA's health screening level for lead dust and arsenic dust.

EPA Dust Sample Results

Location	Lead concentration in fine dust fraction (ppm)	Lead Screening level in fine dust (ppm)	Arsenic concentration in fine dust fraction (ppm)	Arsenic screening level in fine dust (ppm)
Front entry	32,000	316	880	100
Bedroom	57		0.83	

The sampling results indicate **lead and arsenic levels above EPA health screen…** levels in your home. As a precaution EPA is offering to thoroughly clean your h… …to you. If you are interested in scheduling a home cleaning, and have not…

IHC Surface Sediment PCBs



FOIA EPA-R5-2022-005742

IHC Surface Sediment Metals

Grasselli Chemical Company (DuPont) 1927

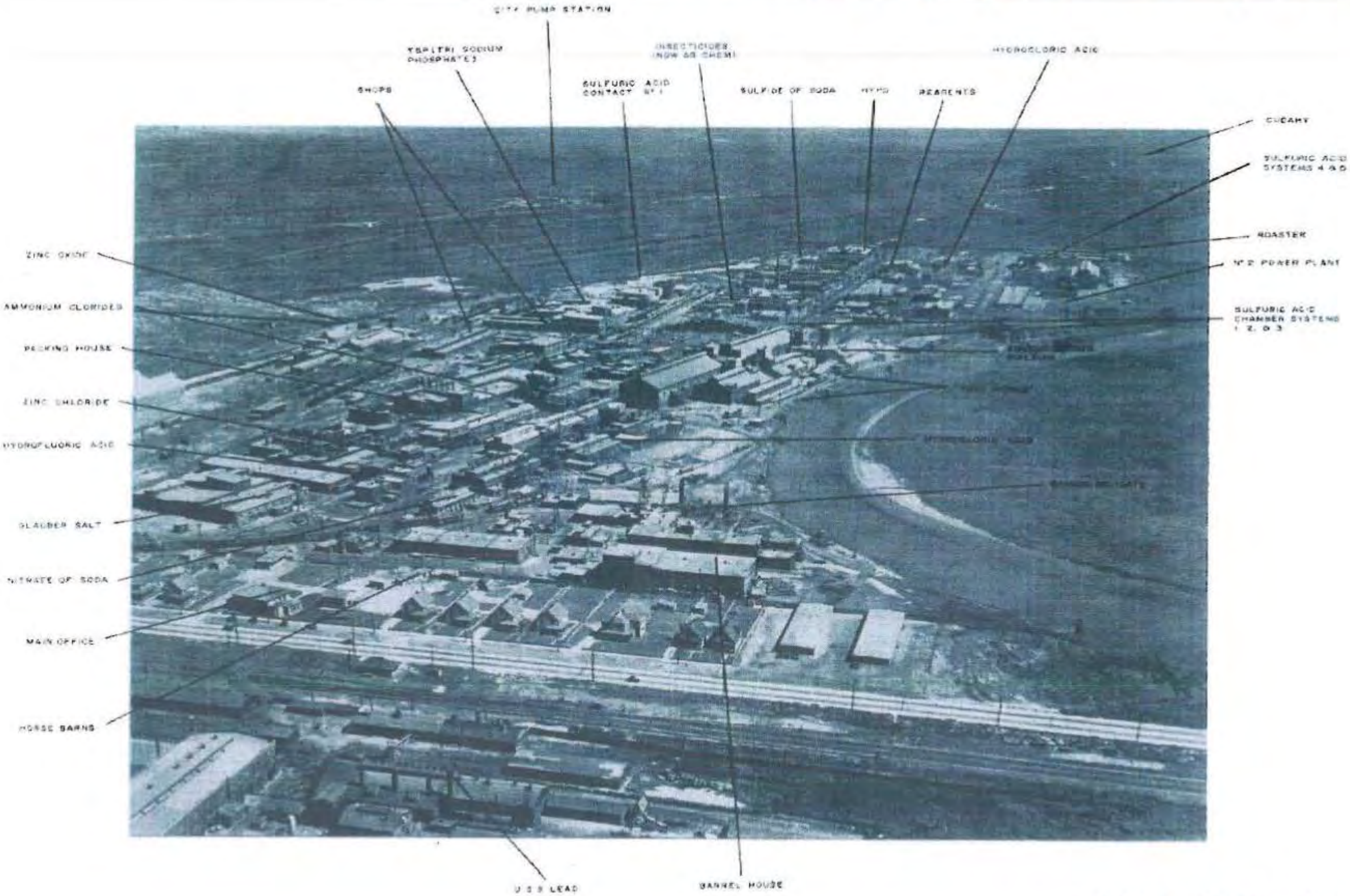
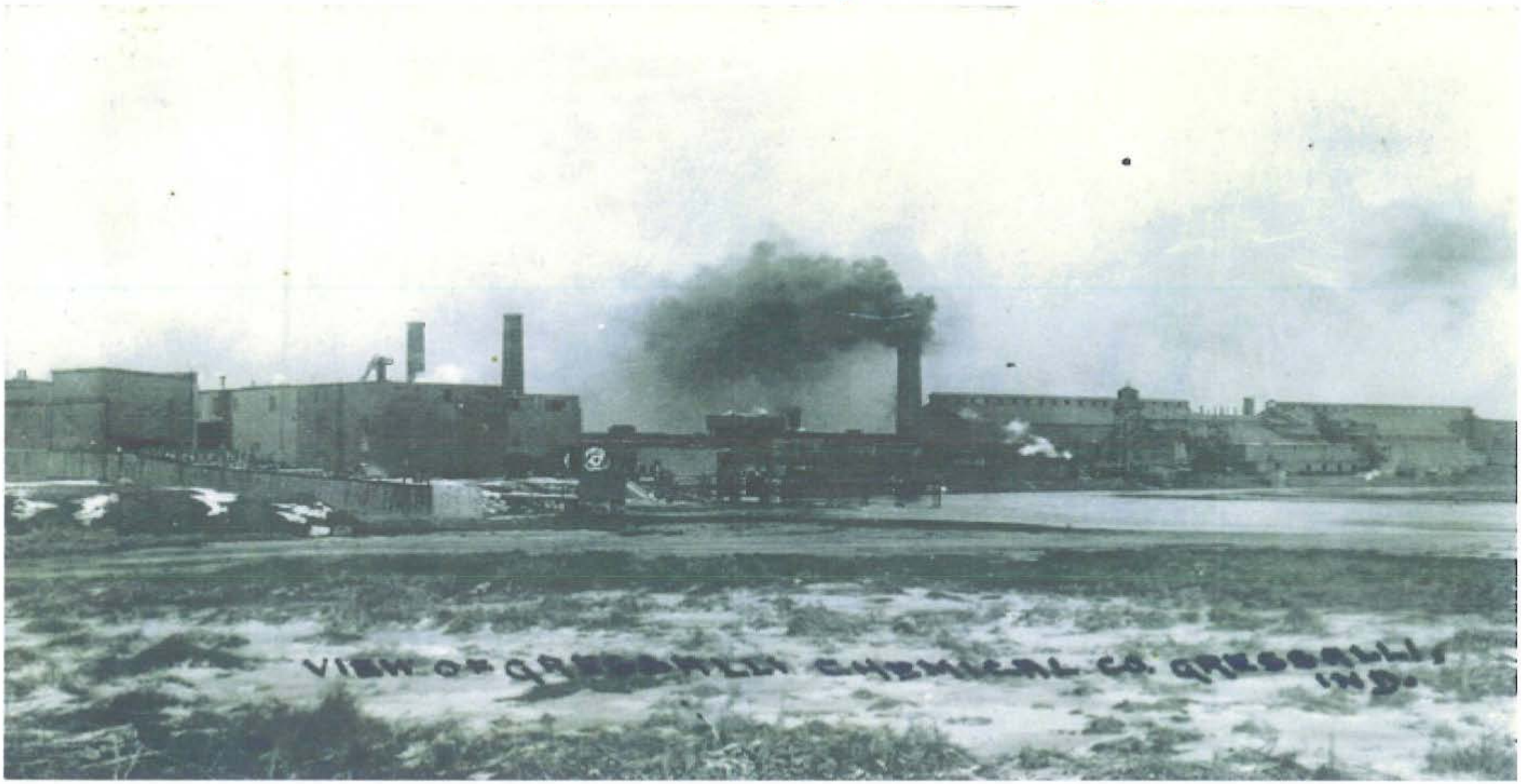
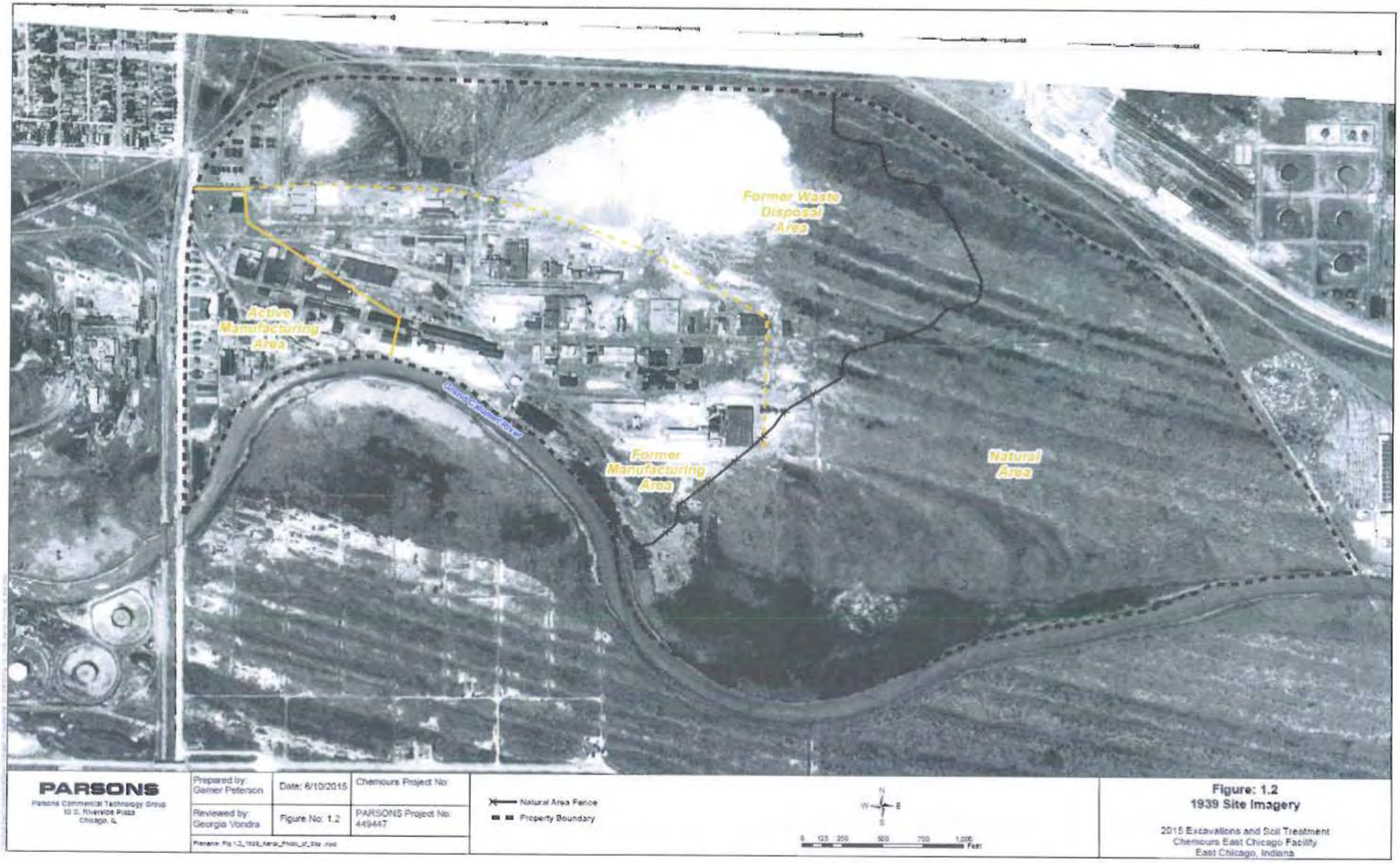


FIGURE 3-3
1927 Aerial Photograph of Site
DuPont East Chicago Current Conditions Report

DuPont is manufacturing 400,000 Tons of Chemicals a year by 1940…



Grasselli Chemical Company (DuPont) 1939

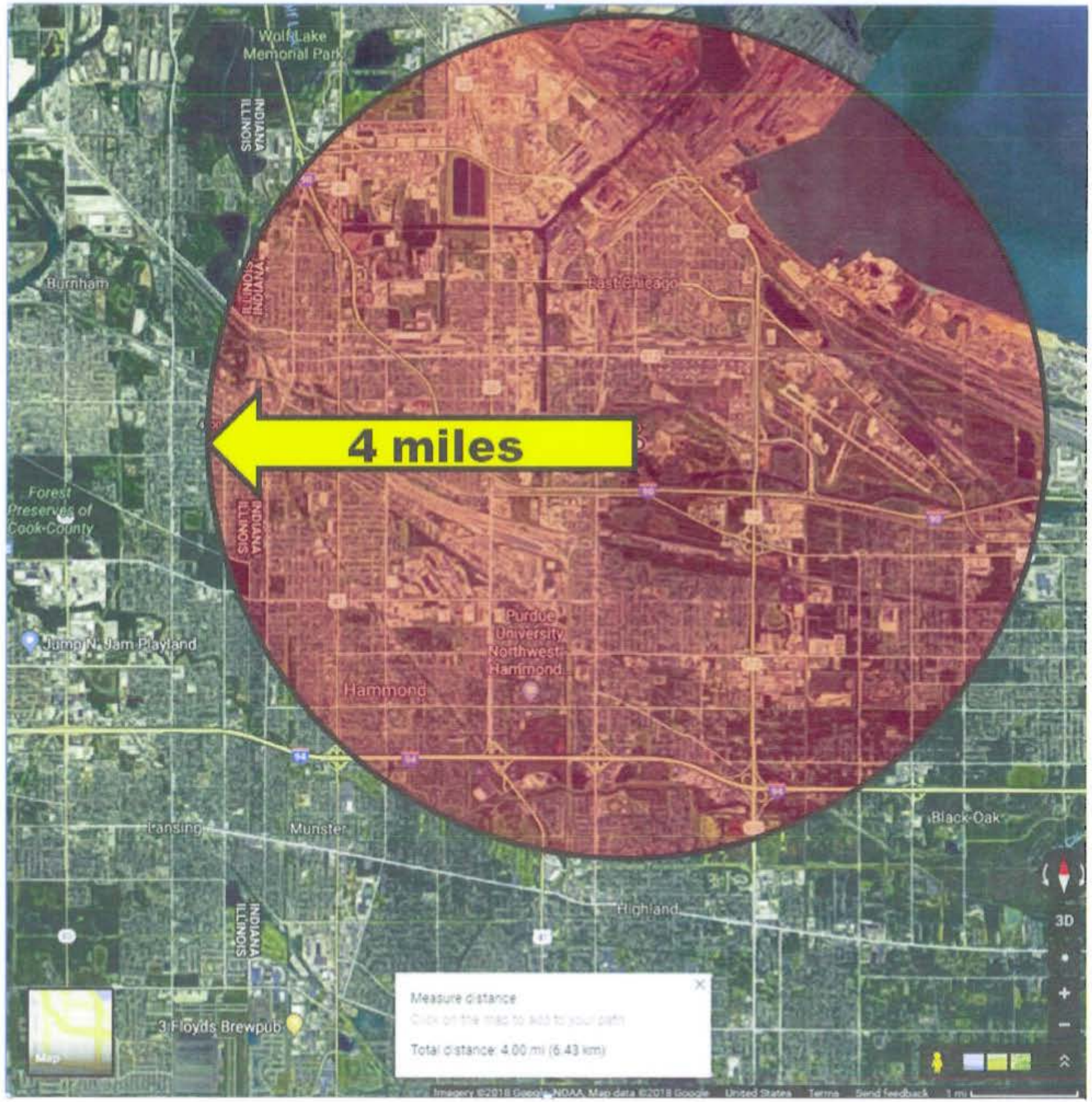


The DuPont Site is 210 feet from Homes in the USS Lead Superfund Site – Zone 3

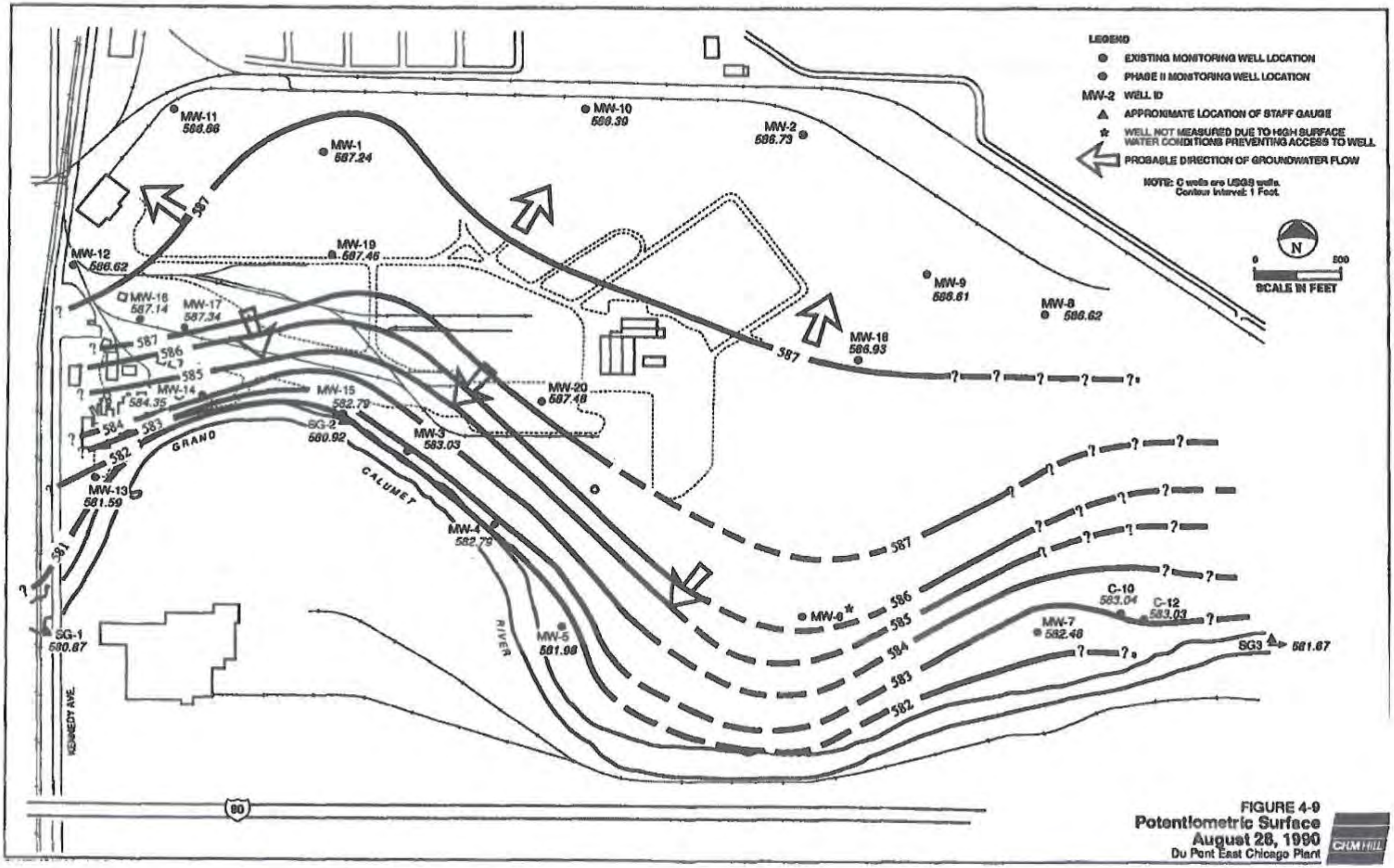
The DuPont Site is 365 feet from Homes in the USS Lead Superfund Site – Zone 2

The DuPont Site is 1 mile from Homes in the Hessville Area of Hammond, Indiana

Over 100,000 People Live Within Four Miles of the DuPont Site and USS Lead Superfund Site...

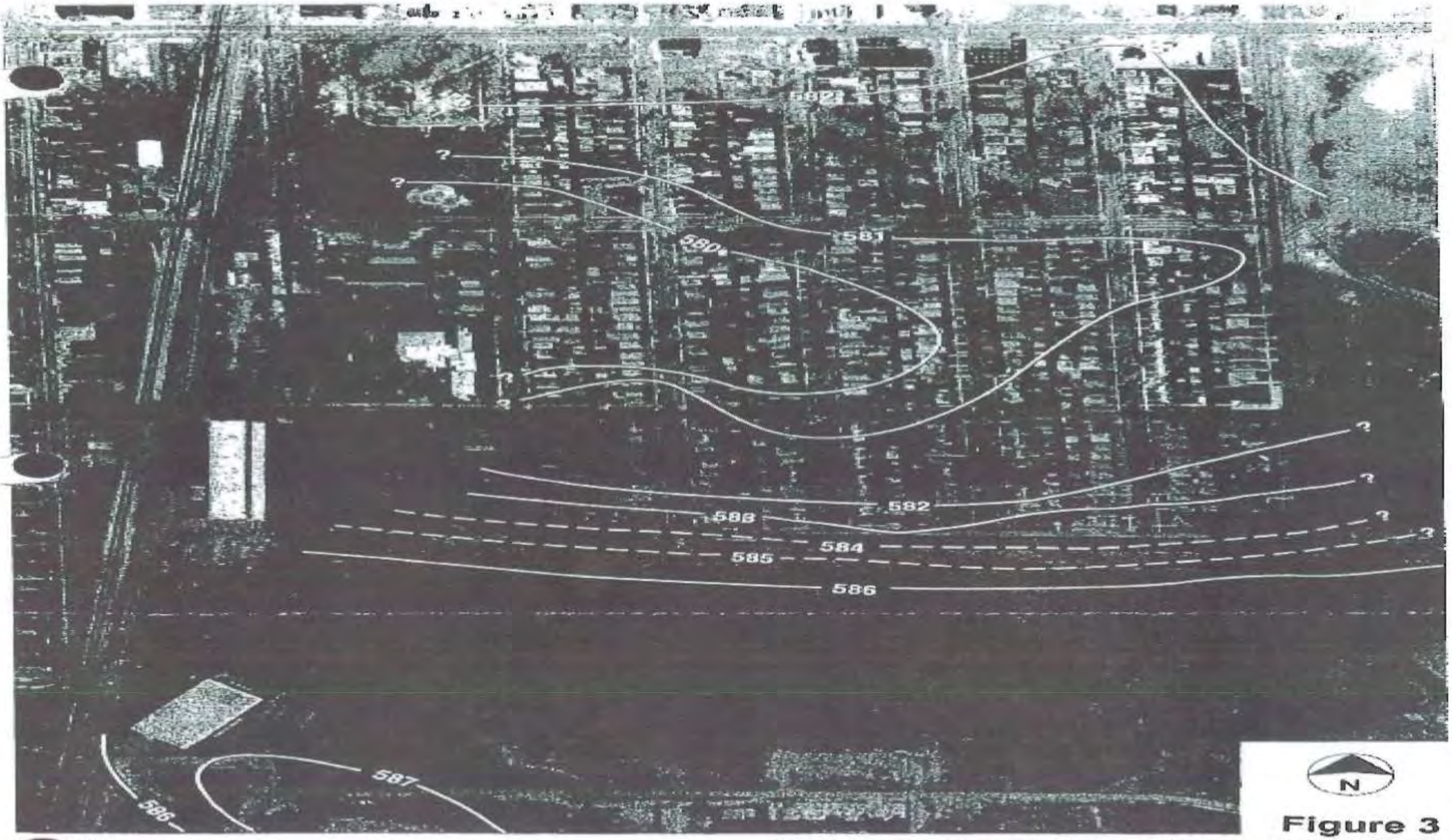


Calumet Sand Aquifer Groundwater Elevations August 1990...



FOIA EPA-R5-2022-005742

Groundwater Elevations in Riley Park September 1990...



ND
…ey area potentiometric surface data from September 27-29, 1990 sewer infiltration observations.

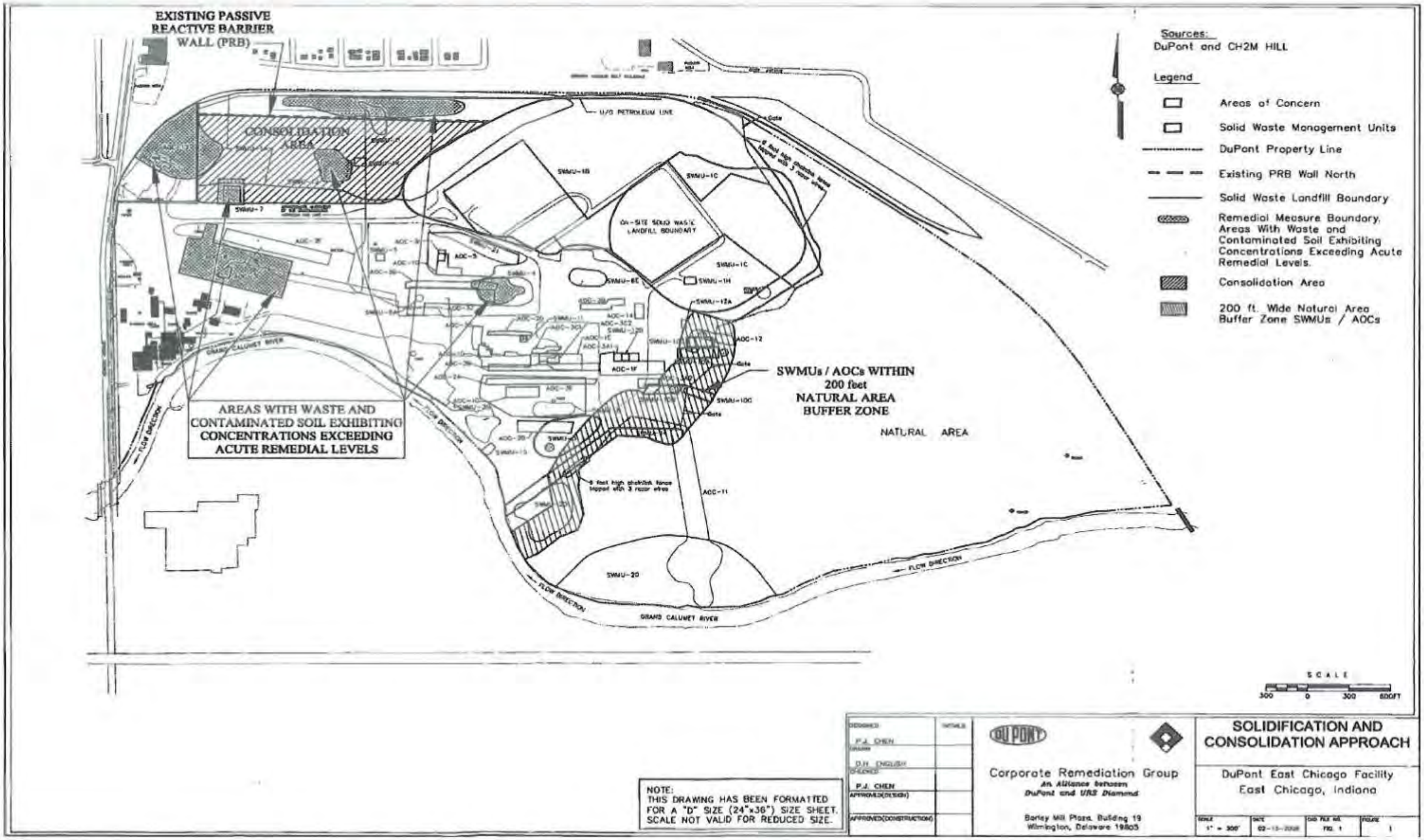
DuPont facility potentiometric surface data from September 10, 1990 monitoring well water level measurements.

E142337.EC.DD Site Potentio 10-17-97/8

Figure 3
Site Potentiometric Surface, Riley Park and Northern Portion of DuPont Facility September 1990
DuPont East Chicago Current Conditions Report

FOIA EPA-R5-2022-005742

How Bad Is It?


EXISTING PASSIVE REACTIVE BARRIER WALL (PRB)
CONSOLIDATION AREA
U/G PETROLEUM LINE
SWMU-1B
SWMU-1C
ON-SITE SOLID WASTE LANDFILL BOUNDARY
SWMU-7
AOC-5
SWMU-6C
SWMU-1H
SWMU-12A
AOC-12
AOC-1F
SWMU-10C
AOC-11
SWMU-20
AREAS WITH WASTE AND CONTAMINATED SOIL EXHIBITING CONCENTRATIONS EXCEEDING ACUTE REMEDIAL LEVELS
SWMUs / AOCs WITHIN 200 feet NATURAL AREA BUFFER ZONE
NATURAL AREA
GRAND CALUMET RIVER
FLOW DIRECTION
Sources:
DuPont and CH2M HILL
Legend
Areas of Concern
Solid Waste Management Units
DuPont Property Line
Existing PRB Wall North
Solid Waste Landfill Boundary
Remedial Measure Boundary, Areas With Waste and Contaminated Soil Exhibiting Concentrations Exceeding Acute Remedial Levels.
Consolidation Area
200 ft. Wide Natural Area Buffer Zone SWMUs / AOCs
SCALE
300 0 300 600FT
NOTE:
THIS DRAWING HAS BEEN FORMATTED FOR A "D" SIZE (24"x36") SIZE SHEET. SCALE NOT VALID FOR REDUCED SIZE.
P.J. CHEN
D.H. ENGLISH
P.J. CHEN
DUPONT
Corporate Remediation Group
An Alliance between DuPont and URS Diamond
Barley Mill Plaza, Building 19
Wilmington, Delaware 19805
SOLIDIFICATION AND CONSOLIDATION APPROACH
DuPont East Chicago Facility
East Chicago, Indiana
1" = 300'
FIG. 1

Conceptual View of the DuPont Site

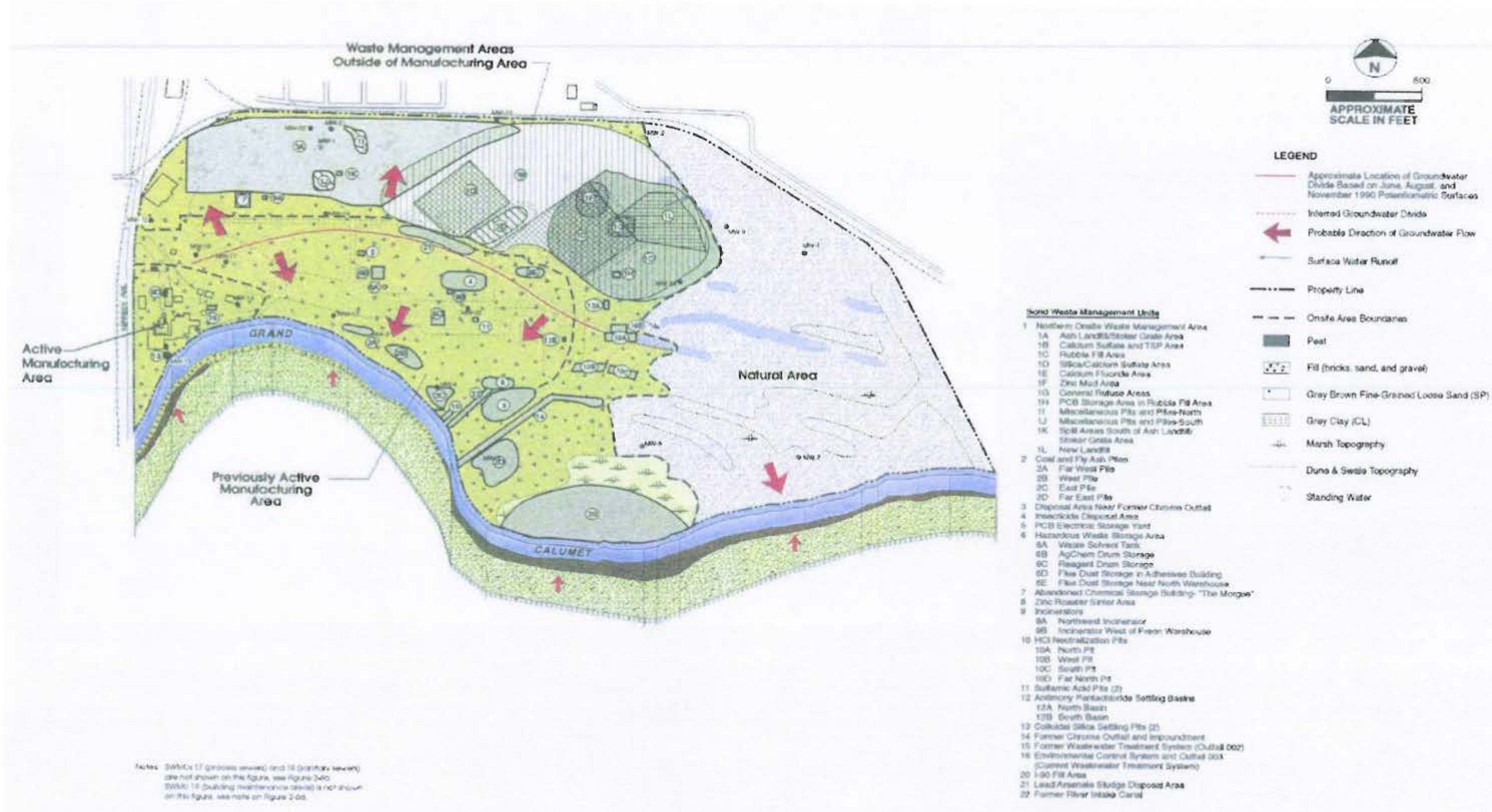
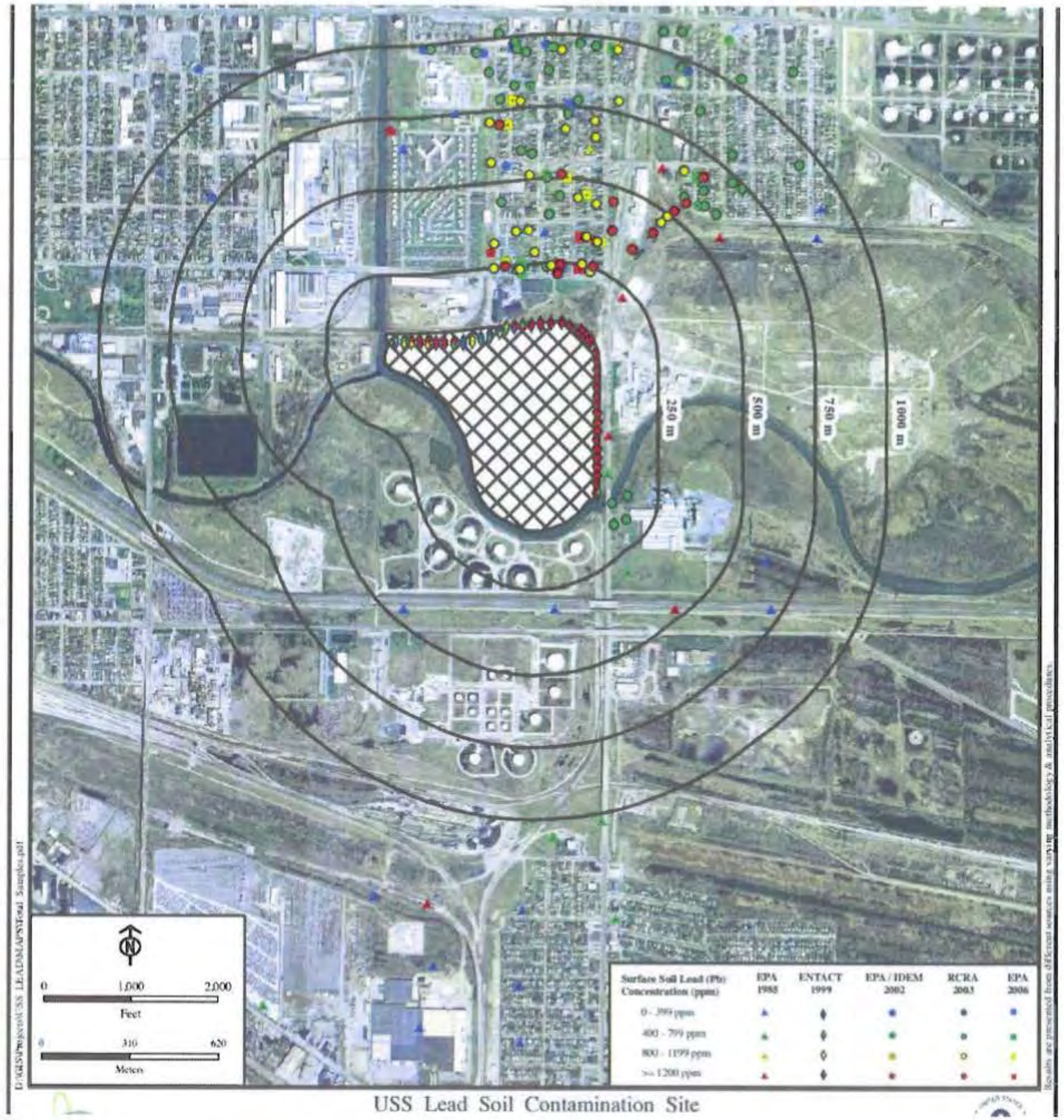


FIGURE 2-10
Conceptual View of the Relationship Between SWMUs and Facility Features
DuPont East Chicago RFI Work Plan

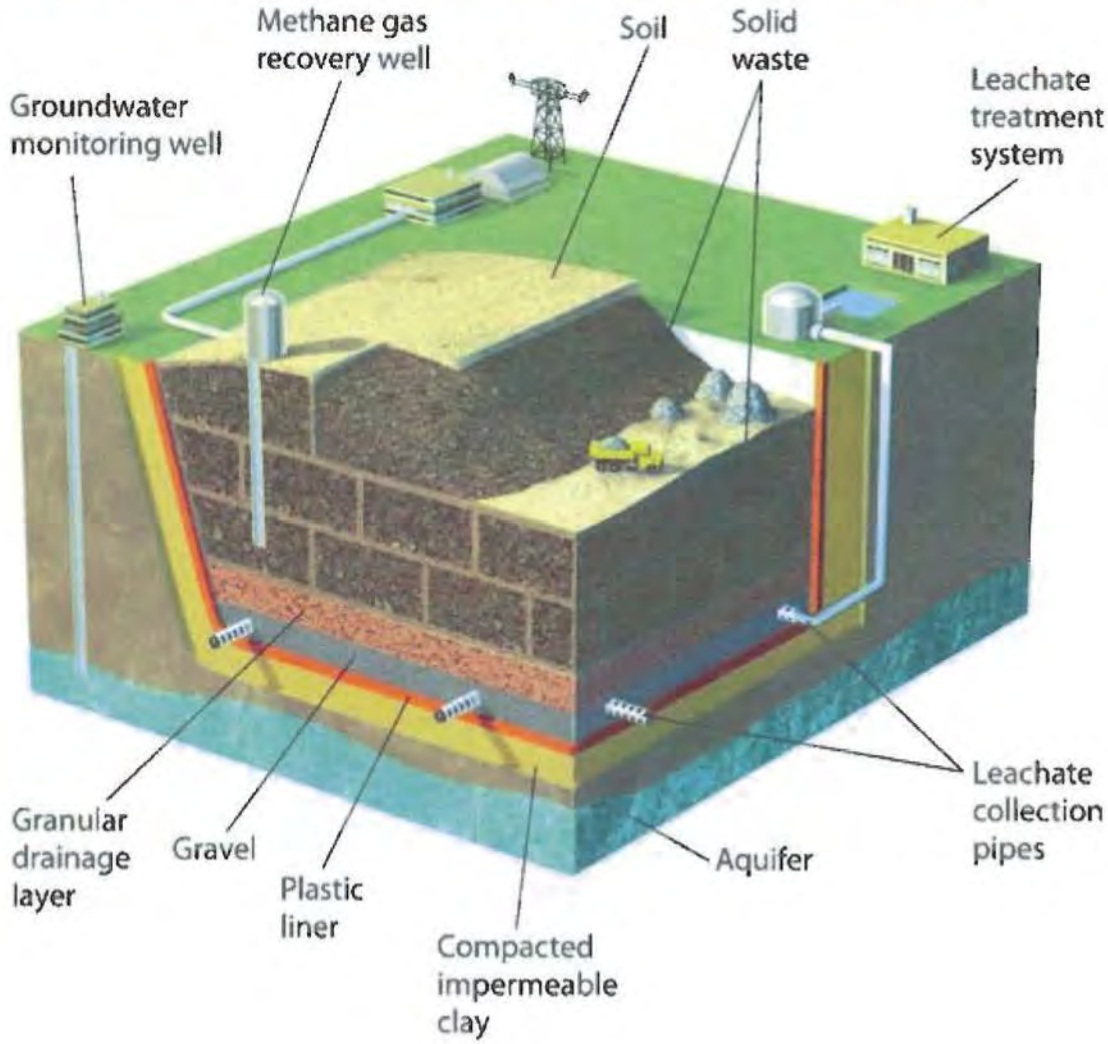
2013 – DuPont's Toxic & Hazardous Waste Management...

USS Lead Superfund Site Lead in Soil Test Results for the Calumet Community 1985 – 2006...



The Calumet Region's Geology is unsuitable for any kind of Toxic or Hazardous Waste disposal... Numerous Toxic waste dumps or fill sites that can not possibly meet current standards have proliferated throughout Northwest Indiana!

- Waste buried in the ground or carefully piled into mounds
- Designed to prevent groundwater contamination and minimize soil and air pollution

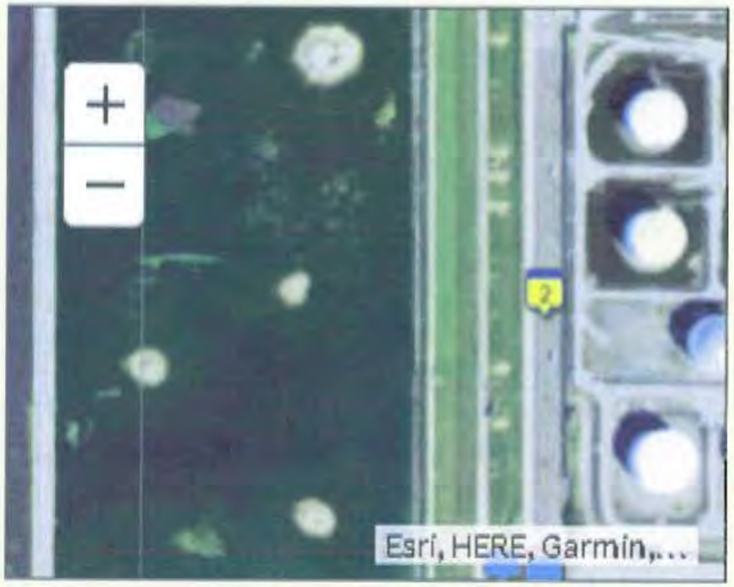


Did You Know?
Regulations require that landfills be at least 6 m above the watertable.

Detailed Facility Report

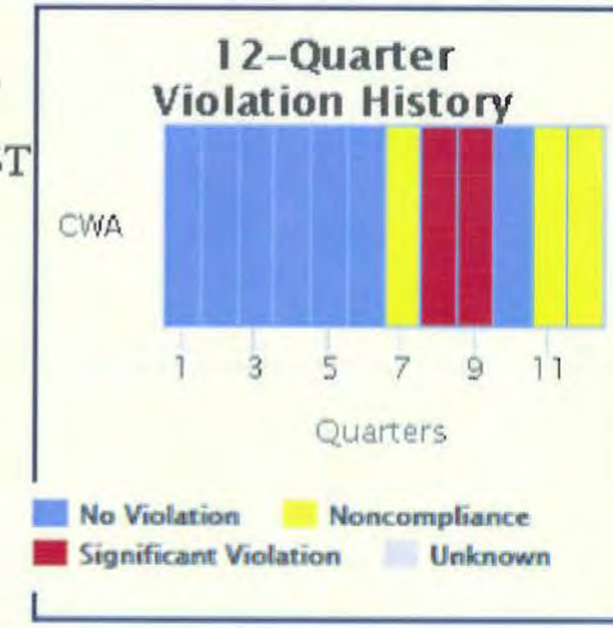
+ Expand All — Collapse All Report Violation Report Data Error Data Dictionary

Facility Summary



INDIANA HARBOR & CANAL
CONFINED DISPOSAL FACILITY
3500 INDIANAPOLIS BLVD, EAST
CHICAGO, IN 46312

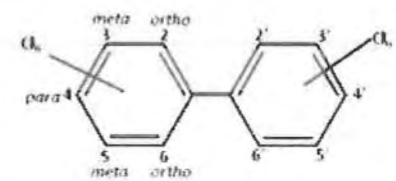
FRS ID: 110028090580
EPA Region: 05
Latitude: 41.65193
Longitude: -87.4809
Locational Data Source: NPDES
Industry: Gasoline Service Stations
Indian Country: N



Enforcement and Compliance Summary

Statute	Insp (5 Years)	Date of Last Inspection	Compliance Status	Qtrs in NC (of 12)	Qtrs in Significant Violation	Informal Enforcement Actions (5 years)	Formal Enforcement Actions (5 years)	Penalties from Formal Enforcement Actions (5 years)	EPA Cases (5 years)
CWA	4	09/09/2015	Noncompliance	6	2	1	--	--	--

Indiana Harbor and Ship Canal, not just a tributary source of PCBs into Lake Michigan



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[2] Dept. of Biostatistics, The University of Iowa, Iowa City, IA

Study area: IHSC

- Highly industrialized zone, but also there are residential areas and schools.
- Area of Concern (heavy metals, PAHs, PCBs).
- Navigational dredging is planned to commence August 2012 (30 yr and ~1.2 million m³ of sediment).
- A confined disposal facility (CDF) near IHSC has been built.

Top: aerial photograph of IHSC. Right: IHSC map, showing dredging area (blue) and CDF (yellow).

Today's talk

Environ. Sci. Technol. 2010, 44, 2803–2808

Fate of PCB Congeners in an Industrial Harbor of Lake Michigan†

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Received September 24, 2009. Revised manuscript received January 4, 2010. Accepted January 22, 2010.

We have quantified the release of polychlorinated biphenyls (PCBs) from Indiana Harbor and Ship Canal (IHSC) to Lake Michigan and the atmosphere. Navigational dredging is planned for this system, and there is concern that dredging will result in releases of PCBs. We have analyzed greater than 158 PCBs in surficial sediment, water, suspended particles, and air. We predicted the release of PCBs from sediments to water and from water to air. To quantify the level of confidence in our calculations, we used a Monte Carlo simulation for each congener flux. We determined that 4 ± 0.05 kg of ΣPCBs were released from the sediment to the water and 7 ± 0.1 kg of ΣPCBs were volatilized from the water to the air annually. We measured input from the upstream regions of the canal system of 45.0 kg yr^{-1} and export to Lake Michigan of 43.9 kg yr^{-1}. The ΣPCBs mass balance accounts for nearly all the PCB inputs and losses to the navigational regions. The congener profiles in sediment, water, and air support our determination that the contaminated sediment is a major source of PCBs into the water and air above it. We have shown that the system is currently a significant source of PCBs to the air and to Lake Michigan, even under quiescent conditions.

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Methods

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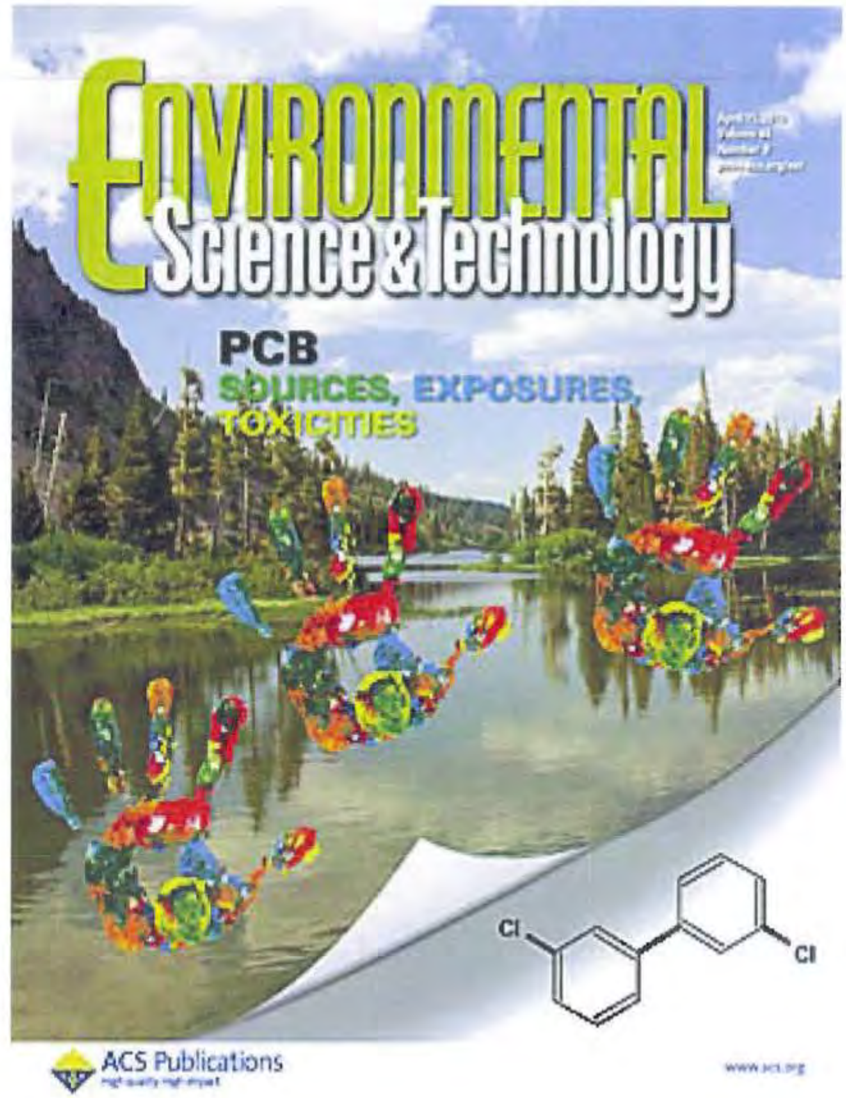
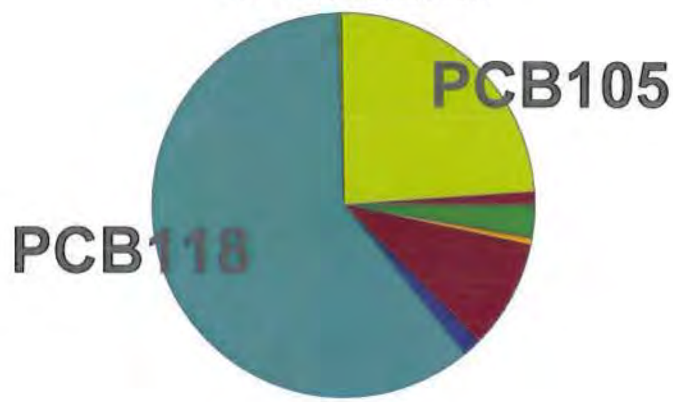


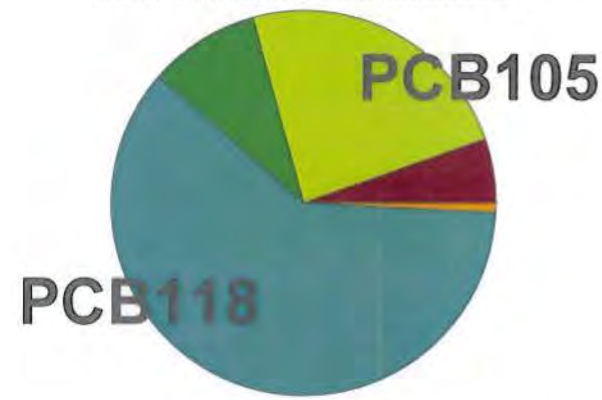
Results:
Toxic effect

- 12 "dioxin-like" PCBs (Toxic equivalency factors, TEQs).
  - Agonist of Aryl hydrocarbon receptor (change in gene transcription).

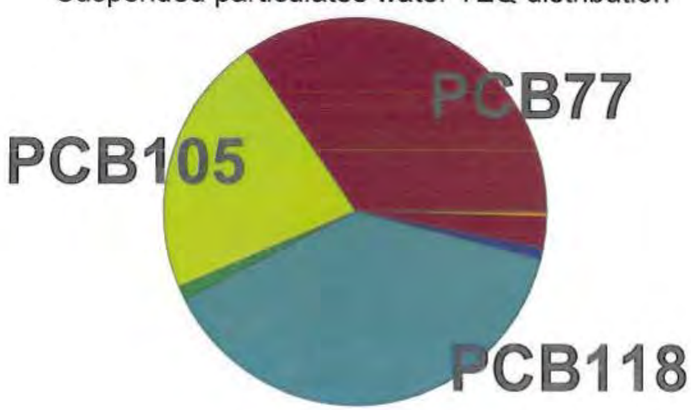
Air TEQ distribution



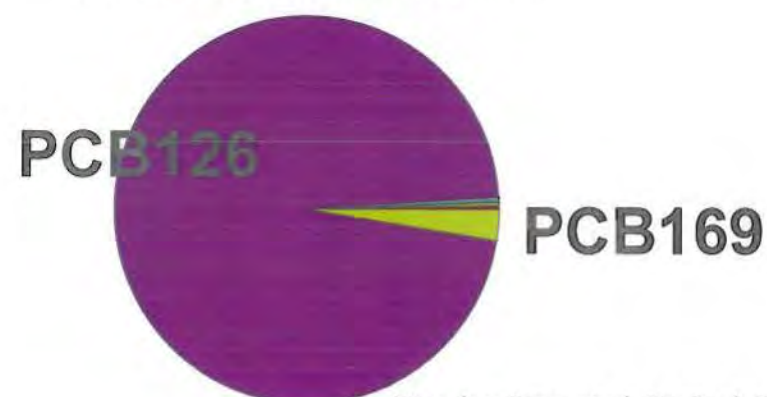
Dissolved water TEQ distribution



Suspended particulates water TEQ distribution



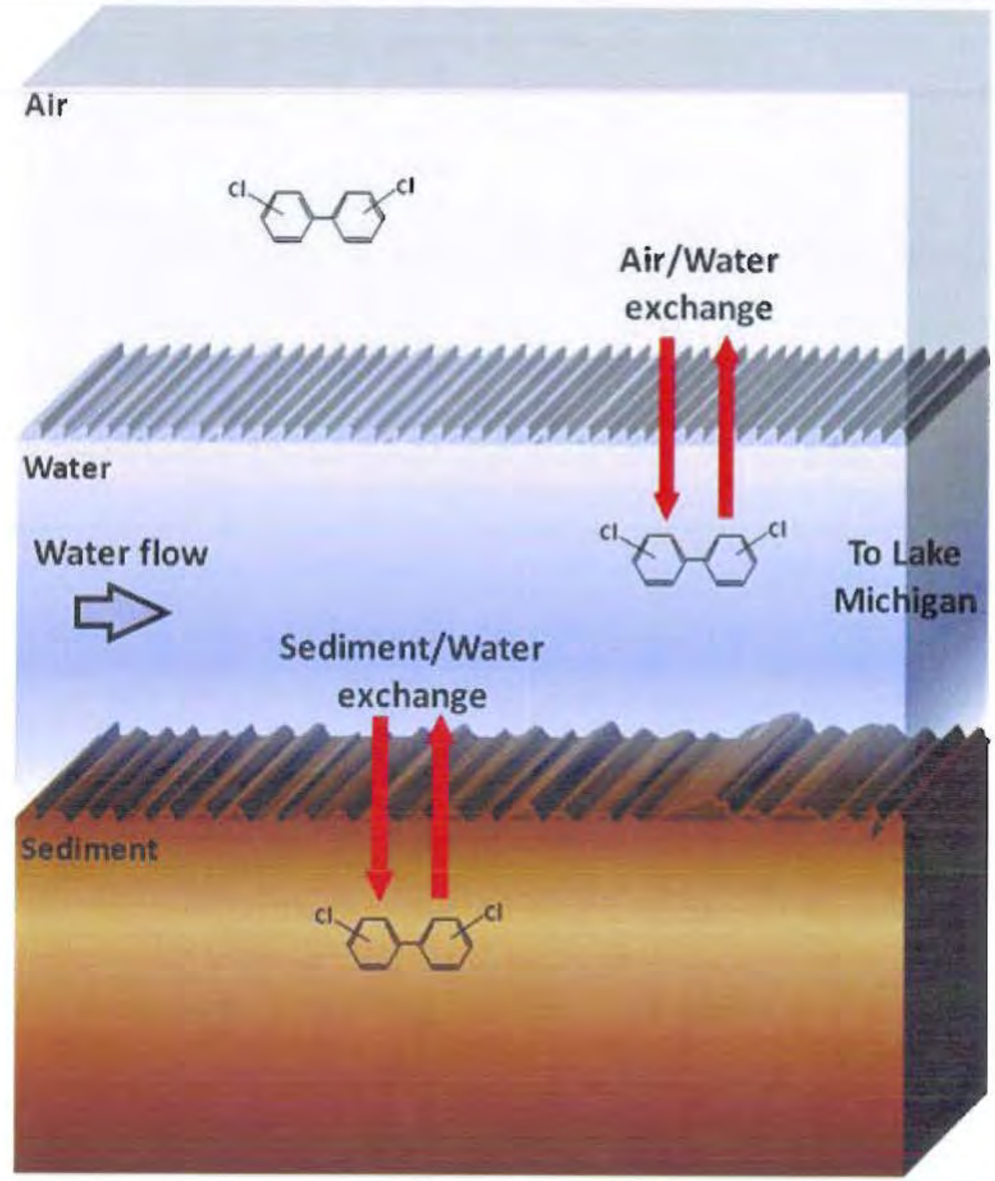
Surficial sediment TEQ distribution



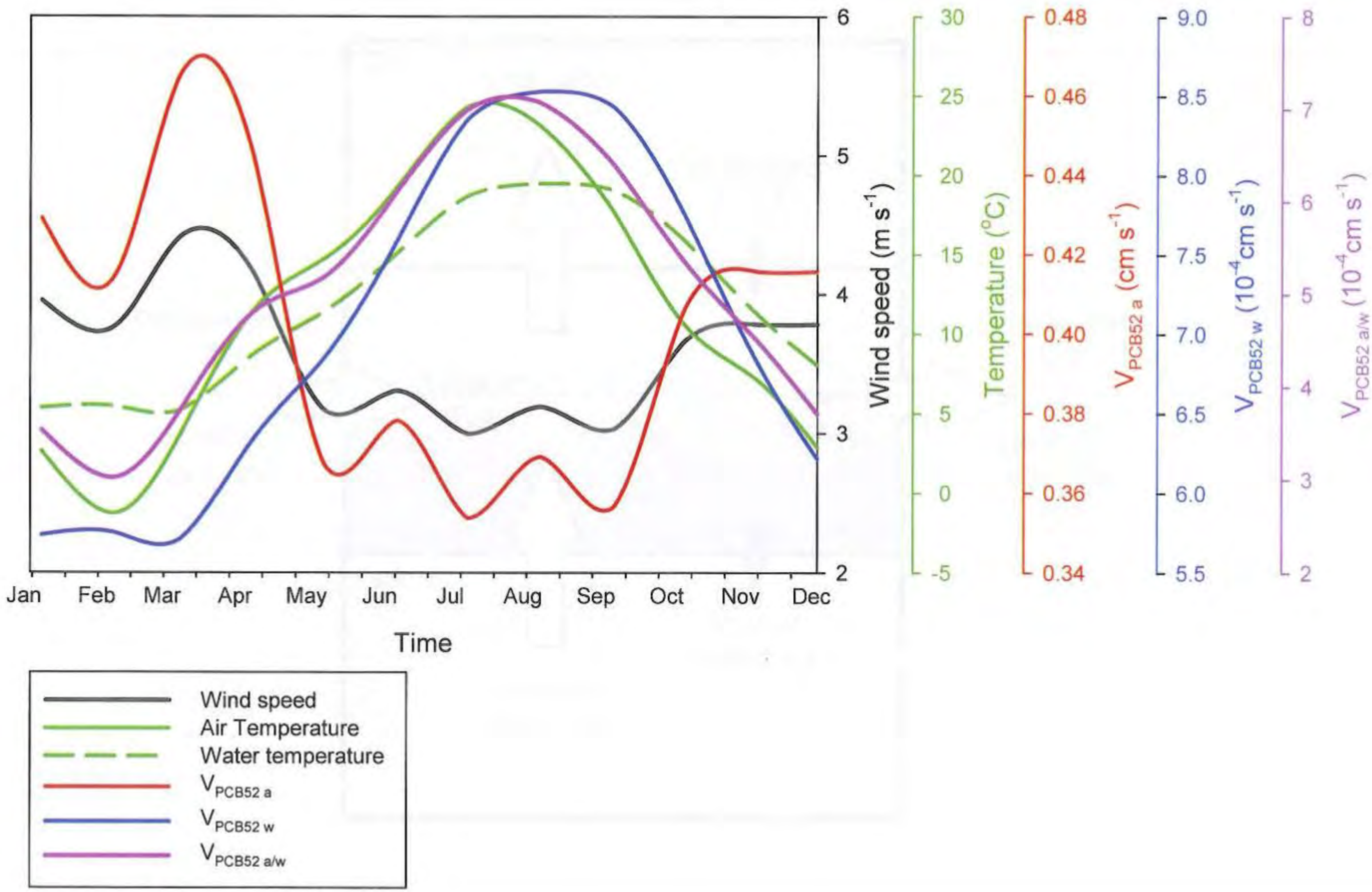
Van den Berg et al. *Toxicol. Sci.* (2006)

Flux exchange model development

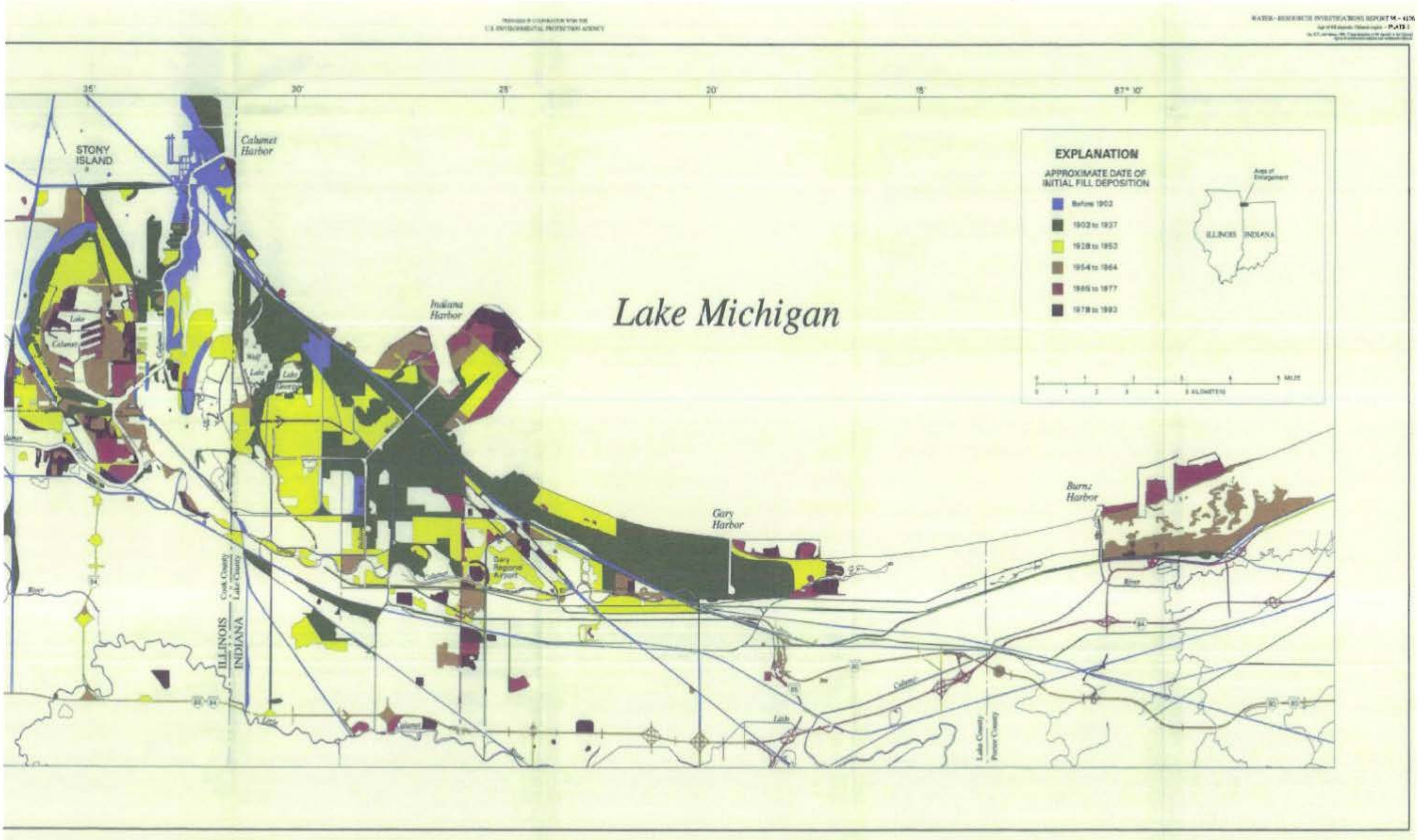
- Flux models for both interfaces (air/water and sediment/water) are based on the gradient-flux law or Fick's first law.



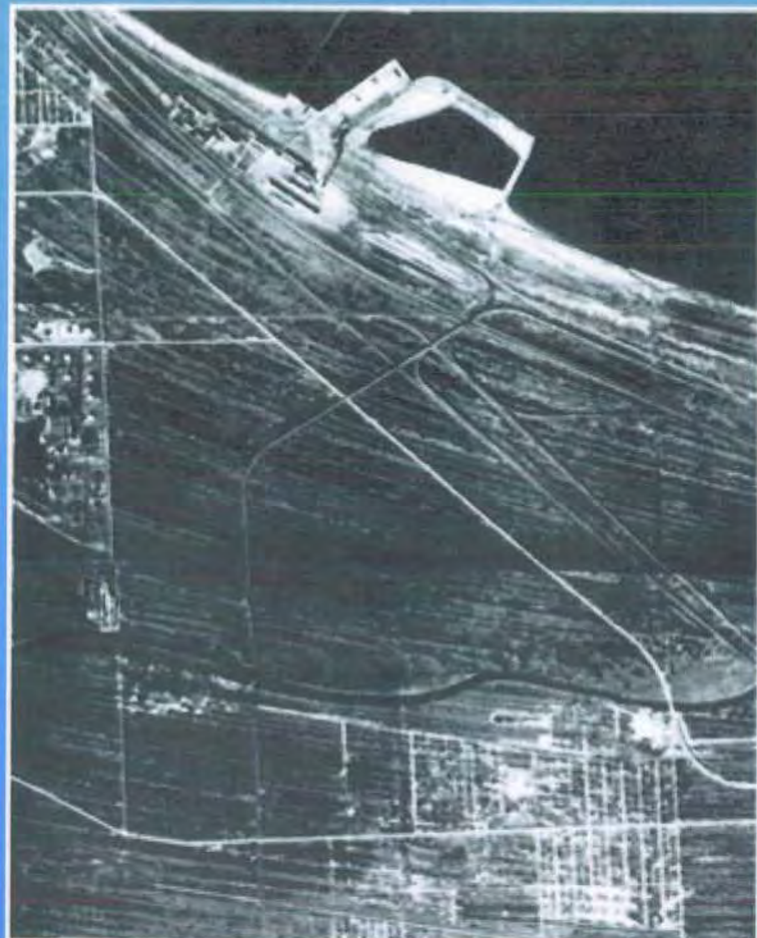
Results:
Seasonal variation (air/water variables, PCB52)



21,000,000,000 Cubic Yards of Fill by the 1990s



APPROXIMATE DATE OF INITIAL DEPOSITION OF FILL, CALUMET REGION OF NORTHWESTERN INDIANA AND NORTHEASTERN ILLINOIS



Gary, Indiana 1938

Gary, Indiana 1996

The photo on the left was taken in 1938 and is a representation of our area before major industrialization. The swales are the darker areas within the beach ridges. You can visually see how the shoreline changed as the lake level continued to fall after glaciation. The photo on the right was taken in 1996 and it is evident that the development of northwest Indiana has destroyed or filled in the beach ridges and swales. Images courtesy of www.igs.indiana.edu (left) and Thompson & Baedke, 1997 (right).

January 2019

RE: Facts about toxic contamination in Northwest Indiana…

Hello, please find attached the following information / discussion subjects:

1) January 14, 2019 Written Comments to U.S. Environmental Protection Agency (U.S. EPA) concerning the 'Proposed Record Of Decision (ROD) Amendment for the U.S. Smelter and Lead Refinery, Inc. Superfund Site in East Chicago, Lake County, Indiana – EPA ID: IND047030226'

2) East Chicago Drinking Water Overview

3) DuPont Resource Conservation and Recovery Act Corrective Action (RCRA CA) Site

4) Indiana Harbor and Canal Confined Disposal Facility (IHC CDF)

5) Green New Deal / Good Jobs, Green Jobs / Revitalization of Northwest Indiana's Industries to Zero Discharge Facilities that also can use the last century of toxic & hazardous legacy wastes as raw materials in zero discharge processes by design.

6) The need for a industrial scale cleanup using innovative technology to remove, recover & recycle and reduce the volumes, mobility, and toxicity of contamination in our environment in order to restore contaminated lands to their highest use and value in accordance with people's visions for their community free from contamination of: land & water, and homes and workplaces.

<u>Summary</u>:

1) The main point of the January 14, 2019 Written Comments to U.S. EPA is:

   The most protective and lowest long-term cost cleanup is the most permanent cleanup – one that permanently eliminates the toxic health threats and financial liabilities for both Potential Responsible Parties (PRPs) and contaminated communities by using innovative technologies to remove the sources of contamination from the community's environment forever…

This can be accomplished through by reclaiming and recycling valuable resources and full decontamination and restoration of the soils and groundwater in the USS Lead Superfund site and adjacent contaminated areas.

Such a permanent solution requires U.S. EPA selection of Remedial Action Alternative 4D followed by a combined system of treatment technologies to separate, reclaim & recycle, decontaminate, and restore both soils and groundwater – one that actually reduces the volumes, mobility, and toxicity of toxic & hazardous contamination in our environment...

At U.S. EPA's Public Hearing on the ROD Amendment no member of the public spoke in favor of U.S. EPA's preferred Remedial Action Alternative 4B – a twenty-four inch dig-up and dump somewhere cleanup...

2) East Chicago Drinking Water Overview:

"Before excavation, 18 of 43 (42%) homes had lead levels in tap water that exceeded 15 parts per billion (ppb)." "...16 to 21 samples collected at each home before and after soil clean-up" – 'EPA Pilot Study on Soil Excavation Activities and Lead in Water' U.S. EPA, January 28, 2017

Miguel A. Del Toral, Groundwater and Drinking Water Division Regulations Manager, U.S. EPA Region V gave a PowerPoint presentation in East Chicago, Indiana dated August 19, 2017 in which he states the following:

"In East Chicago, lead is not coming from the water source, water treatment plant or mains. Lead comes from service lines and home plumbing, which means it cannot be removed at the plant like other chemicals that are found in the source water"

"To achieve zero risk, must remove lead service lines and associated galvanized iron pipe and all leaded plumbing components in home"

"Sampling: Each Home is Different" "Lead is Variable Within Each Site" "At 53% of the sites sampled in this study, the site can be above or below 15 ug/L based on the liter (sample bottle) selected." [Note: ug/L = Parts Per Billion (ppb)]

The Northwest Indiana Times has reported that:

"More than a year before the U.S. EPA found dangerous lead levels in drinking water at 18 East Chicago homes, the city began using a chemical to control corrosion of lead pipes approved by IDEM but not recommended by experts, because it actually can increase lead release.

In a city where up to 90 percent of water lines could contain lead, using sodium hexametaphosphate might have been worse than conducting no corrosion control at all, said Marc Edwards, a professor of civil and environmental engineering at Virginia Tech." and

"EPA's recent sampling, which was more robust than the testing required under the Lead and Copper Rule, showed some of the highest lead levels found in individual samples were 130, 87 and 81.2 ppb.

"Any result of 15 ppb is a major cause for concern," Edwards said. "Exposure to water at 15 ppb can certainly increase blood lead in children above CDC levels of concern, without any other source of lead exposure in a child's environment."

"According to a service line information sheet on file with IDEM, an estimated 9,000 out of 11,000 lines in East Chicago contain at least some lead."

"In 2014 alone, East Chicago lost just over 31 percent of its water due to leaks associated with aging pipes. An improved metering system will help the city identify problematic leakage in sections of the city."

Contaminated Backflow Prevention from potential cross connections with industrial uses of public drinking water is also an issue in East Chicago, Indiana… I am witness to East Chicago, Indiana Attorney Carla Morgan's public statement that the city has found some industries hooked up the city's drinking water without any water meter – if there is no water meter it's very doubtful there is any Cross Connection Control Device(s) in place either…

3) DuPont Resource Conservation and Recovery Act Corrective Action (RCRA CA) Site

The 105 year history of the largest chemical and pesticide manufacturing facility in our nation includes the fact that the DuPont Facility in East Chicago, Indiana never had a Part B Final RCRA permit even though they generated, stored, treated and disposed of vast quantities of Listed and Characteristic Hazardous Wastes for decades!

U.S. EPA maintains that everything is covered by the RCRA CA Order and that no permits are necessary even though their own internal guidance, U.S. EPA correspondence and the laws passed by the U.S. Congress indicate that permits either are required or could be required by U.S. EPA and/or IDEM...

This includes no RCRA Permit; no Underground Injection Control UIC Program Permit for Class IV remedial injection activities Including: Steel Slag Permeable Reactive Barriers, Bio-Walls; and Nutrient and Reagent Injections into the Calumet Sand Aquifer; and no National Pollutant Discharge Elimination System (NPDES) Permit for thousands of feet of abandoned sanitary and process sewers that are in deteriorating condition and known to be intercepting and discharging contaminated groundwater at various points throughout the systems...

U.S. EPA has allowed contractors to actively manage and dig up areas containing numerous Listed Hazardous Wastes (banned from land disposal by U.S. Congress) and Characteristic Hazardous Wastes including toxic metals at extremely high concentrations mix them with sand and buffering materials and then re-dispose of the wastes in the active onsite landfill closer to the residential area of the Calumet neighborhood in East Chicago, Indiana.

The unpermitted landfill is situated on top of a site that literally is dumps built on top of dumps like a layer cake as shown in several soil borings taken on- site.

These landfills (dumps) do not have any leachate or vapor collection systems, a few have few inches of clay liners but most completely lack liners or caps. Some of the landfilled wastes are buried below the surface of the Calumet Aquifer an unconfined water table aquifer hydraulically connected to Lake Michigan – two miles away...

DuPont's active on-site landfill was suppose to undergo RCRA Closure in the late 1990's and that an Administrative Order was signed between DuPont and IDEM concerning Listed Hazardous Waste violations in East Chicago, Indiana;

"The modification being requested involves the replacement of the 12inch clay cover with a Geosynthetic Clay Liner (GCL)."

The active onsite landfill is considered a class IV Exempt Special Waste Landfill by IDEM – this exemption was based upon the Condition that the landfill would only accept non-hazardous waste from the production of Colloidal Silica from DuPont.

Interestingly, as shown by the Lake County Indiana Surveyor's office W.R Grace owns the property where the generation of the waste from the production of Colloidal Silica takes place while Chemours and now a LLC corporation from the state of New York own the property where the active on-site landfill exists...

At this point the DuPont site is considered by U.S. EPA and IDEM as a Conditionally Exempt Small Quantity Generator. This is difficult to believe given the massive amounts of contaminated leachate that has occurred on-site and is ongoing as evidenced by reports of leachate seeps at the toe of the landfills.

They are now planning to dig up 61,780 cubic yards of highly contaminated wastes & soil from the Western Portion of the DuPont Site including an estimated 127 tons of Arsenic on-site (enough to poison to death over one-half million people) and another 14,000 cubic yards of Lead contaminated surface soils from the operating portion W.R. Grace and Company and haul it off to another community for disposal of what should be considered toxic waste banned from land disposal as Listed Hazardous Wastes, Characteristic Hazardous Wastes and/or Persistent Organic Pollutants (POPs).

How can U.S. EPA allow the re-disposal of Land Banned Listed Wastes under RCRA Corrective Actions and CERCLA Remedial Responses such as Emergency Removal Actions without proper permits or legally permitted disposal facilities that meet current state and federal statutes and regulations?

Has there been, and is there currently operating, an unpermitted commercial landfill operating outside of the requirements of federal and state laws and rules that has illegally accepted toxic metals, persistent organic pollutants (POPs), and Listed Hazardous Wastes in violation of its permitted conditions on the former DuPont Facility?

4) Indiana Harbor and Canal Confined Disposal Facility (IHC CDF)

The approval for PCB Risk-Based Disposal of sediment containing Polychlorinated biphenyls (PCBs) in the Indiana Harbor and Canal Dredging Project by USACE under the Toxic Substances Control Act (TSCA) 15 U.S.C. § 2605 (e) (1) creates the largest PCB land disposal facility on the Great Lakes and is located less than one-half mile from schools, public parks, and residences...

In contrast, the Indiana Administrative Code prohibits locating the boundary of a municipal solid waste landfill within one-half mile from a public or nonpublic school see: 329 IAC 10-16-11 Setbacks.

A study to evaluate the toxicity of sediments from the Grand Calumet River and Indiana Harbor Canal found "...that sediments from this assessment area are among the most contaminated and toxic that have ever been reported."

"Because this is a maintenance dredging project, dredging can occur only to the authorized depth of 22 feet, though in places contamination is as deep as 40 feet." U.S. Army Corps of Engineers (USACE)

The USACE is culpable in creating this deep sediment trap within the IHC where more highly contaminated sediments exist because during World War II the dredging done by the USACE was almost twice as deep as the authorized navigational depths in some locations of the IHC. The USACE should not be allowed to leave these more highly contaminated sediments in place and should be required to dredge the IHC to a clean bottom.

"If the underlying sediment is twice as concentrated with PCBs as the surface sediment they're getting rid of, then it's likely the airborne levels will double" in East Chicago, Hornbuckle said."

Human health risk estimations, real time monitoring, and operational response actions have been reduced to a single surrogate chemical: Naphthalene – a solid at ambient temperatures that undergoes sublimation – a chemical with different physical properties than normal evaporation for the majority of Volatile Organic Chemicals (VOCs) known to be present in the IHC's "heavily contaminated sediments."

Many of these same toxic contaminates were already present in soils, an estimated 2.3 million gallons of floating free phase hydrocarbon layers of sub-surface wastes, and the grossly contaminated groundwater at the former Sinclair Refinery and Energy Cooperative Inc. Site where the USACE built an unlined Confined Disposal Facility (CDF). The CDF is surrounded by a Slurry Wall that was constructed in phases using different contractors and equipment and was installed according to the property boundaries not the known extent of contamination on-site and off-site...

"The sample with the PCB concentration of 850 mg/kg was collected from MW-6, located by the canal at the southern end of the property." – USACE

Another monitoring well showed a concentration of 750,000 ppm for Phenol.

In the spring of 2015, oiled and dead ducks were observed in West (Lake George) Branch of the IHC. The Northwest Indiana Times reported that: "The old ECI site has petroleum product leaching from the property into the canal," Barry Sneed, spokesman for the Indiana Department of Environmental Management, said."

U.S. EPA and IDEM permitting of the IHC CDF has failed to consider impacts of increases in volatile contaminate emissions and the risks associated with design and operational changes the USACE has made including:

– CDF design changes to two large surface area unlined cells;

– discharge of groundwater extraction wells to the CDF's unlined cells;

– use of CDF's wastewater as dredged waste debris wash water;

– unexpected increases in dredged debris handling and washing;

– slurrying of dredged wastes for hydraulic placement;

– ponded CDF operation impacts on the Waste Water Treatment Plant;

– ponded CDF operation impacts on the hydrogeology of the Calumet Aquifer;

– unexpected decreases in several extraction wells capacity and pump failures;

– and unexpected reduction of inward groundwater gradient and difficulties in maintaining necessary capacity for groundwater extraction during dredging operations.

"Dredged sediment varies from clay to oily sediments, but most is a sloppy muck, laced with tons of debris that was not expected prior to the start of the project. This excavator unloads the dredged material into a third barge topped by a steel woven mesh, which catches the debris, allowing the sediment to drop into the wet well beneath. After trial and error, the correct mesh size was discovered, and a manifold system that sprayed water across the mesh washed most of the sediment into the wet well." "...electric pumps pull water from the CDF into the hopper barge, where two submersible pumps create the slurry" – Dredging Indiana Harbor' Detroit Drone Aerial Video

"...low levels of PCBs have been detected in the groundwater treatment plant influent water from the groundwater gradient system (i.e., in groundwater pumped from the site perimeter). Aroclor 1248 has been detected at concentrations of 0.28 – 0.29 µg/L, while Aroclor 1260 has been detected at 0.27 µg/L." – USACE

"Because the east cell receives groundwater from the groundwater gradient system, and the groundwater contains petroleum compounds, it can be seen that the organic compounds are somewhat higher in the east cell..." – USACE

The expanded size of the CDF's cells increases available surface area for the volatilization of volatile contaminates.

The expanded size of the CDF's cells is large enough to have whitecap wave action in high wind events, heavy rain events, and hail storms. Whitecap wave action can disturb toxic and/or hazardous dredged wastes and can create aerosols from the untreated water within the CSF's cell. The unsupported conclusions that ponded cell CDF operation will reduce particulate emissions to zero are false under common metrological conditions near Lake Michigan and the risks to human health and the environment were not considered.

"...Hornbuckle said PCBs are readily transformed into a gas. The canal already emits about 15 pounds of PCBs into the air every year, according to Hornbuckle's 2011 study."

"Ron Hites, a professor at Indiana University's School of Public and Environmental Affairs who specializes in air monitoring in the Great Lakes basin, agreed with Hornbuckle, saying PCBs on surface waters become airborne."

The IHC CDF cannot meet design, construction, and operation standards for a toxic chemical waste landfill / toxic chemical waste impoundment or hazardous waste landfill / hazardous waste impoundment under current federal and state laws & regulations.

State of the art monitoring utilizing Infrared, LIDAR, and Gas Chromatography devices should be deployed during dredging operations and at the IHC CDF continuously for air monitoring of contaminates known to be present…

"…LIDAR has shown that the concentration of the particulate matter content of clear air is highly variable and that such variations can indicate the structure and motion of the clear atmosphere. These capabilities have applications in atmospheric and meteorological research and various operational activities." – R. T. H. Collis

The IHC CDF has no liner, no leachate collection system, no vapor recovery system, no cap until decades into the future, a slurry wall compromised of a mixture of 6% bentonite clay with contaminated on-site soils, a compromised ground water gradient system, and cannot meet the DOD's and U.S. Army's own requirements for toxic, chemical, or hazardous waste land disposal.

Since 2012 Extraction wells have experienced pump failure due to clogging and reductions in well capacity over time in 3 areas of the Indiana Harbor CDF.

"Comparisons of the specific-capacity values calculated from well development data collected following extraction well installation to those calculated during the single well aquifer tests at EW–4B, EW–14A and EW–11C indicate that the productivity of extraction wells on the CDF property has diminished since 2008." – U.S. Geological Survey

"It is intended that the groundwater protection system would operate in perpetuity to maintain an inward hydraulic gradient on site, and to contain existing historical contamination on site." – USACE

"At this point, because of the dredging operation, there's a large influx of water into the CDF. And what the pump right now is actually constantly running to try to catch up with that influx of water. And so right now, we're slowly – we're regaining the inward gradient." – USACE

The IHC CDF is constructed above two underground pipelines referred to as "4 "deep obstructions" 25 to 29 feet deep" – discovered during slurry wall installation – that cross the site and are of unknown: condition, ownership, or content. These underground pipelines were left in place under the site along with other "Industrial Fill" by USACE compromising slurry wall structure integrity at an estimated 1 gallon per minute rate according to USACE…

The IHC CDF boundaries are arbitrary and are constrained by existing infrastructure surrounding the ECI Site –the CDF's slurry wall does not encompass the entire area of known gross contamination on-site and off-site – making it is nearly impossible to establish groundwater monitoring wells to determine if the IHC CDF is leaking any contaminates when all monitoring wells are located and screened in the same areas of known gross contamination.

For 42 years the USACE has had time to develop and implement innovative technologies for achieving permanent solutions that reduce the toxicity, mobility, or volume of the contaminated sediments in the IHC – instead they have chosen to operate the largest PCB dump on the Great lakes so long as the East Chicago Water Management District assumes all liability for any releases from the CDF…

"The cancer risk due to inhalation exposure to CDF emissions is estimated to be 2.3 x 10-6 (2.3 in 1,000,000). Based on air monitoring data, the total estimated cancer risk due to air toxics inhalation exposure from other sources in the area (i.e., without including CDF emissions) for 30 years is estimated to be 3.1 x 10-4 (3.1 in 10,000 or 310 in 1,000,000)."

"The corps and EPA conclude that a little more pollution can't hurt when things are already this bad. But a resident, or any reasonable person, might well conclude something very different--that simple fairness demands a "no net increase of pollution" rule for East Chicago" – Harold Henderson

5) A Green New Deal / Good Jobs, Green Jobs / Revitalization of Northwest Indiana's Industries to Zero Discharge Facilities that use the last century of toxic & hazardous legacy wastes as raw materials in zero discharge processes by design.

The United States of America lacks comprehensive industrial, energy, policy, environmental, and social policies – policies that support a just transition to an economy and infrastructure that achieves significant reductions in Greenhouse Gas emissions and Zero Discharge of toxic contaminates in our communities! There exists in our nation an absence of financial guarantees for implementing technological innovation & reconfiguration of facilities to install: Energy Efficiency, Renewable Energy, Energy Storage, or Zero Discharge manufacturing processes. There also is a scarcity of technical assistance provided by our U.S. Government to facilitate a just transition and provide leadership going forward while permanently cleaning up toxic legacy contamination at the same time…

At the same time there's a scarcity of corporate leadership in recognizing the need for investment in revitalization of industry to zero discharge processes that eliminate future liability for toxic and hazardous wastes in our communities and have benefits such as increased efficiencies, better profits and secure jobs.

For example: Direct Reduced Iron (DRI) technology not only can be configured to have zero toxic discharge of air and wastewater, reduce greenhouse gases by up to 50%, and use up to 100% steel mill waste as raw inputs for manufacturing Iron for steelmaking but would also reduce costs of manufacturing Iron for steelmaking and increase flexibility & efficiency. ArcelorMittal Steel is the largest producer of DRI in the world but has no such facilities in the United States. This is one area where local steel mills have a potential competitive advantage over the largest steel company in the United States – Nucor Steel – that operates two DRI plants in the United States. U.S. Steel and ArcelorMittal Steel have millions of tons of steel mill wastes sitting on their Lake Michigan shoreline properties from the last century of steelmaking. These wastes are either sources of toxic contamination or are potential resources for DRI plants...

For example there are miles of surface area on Northwest Indiana's industrial, commercial, and residential footprints where support of Energy Efficiency, Renewable Energy, and Energy Storage could be part of the infrastructure by design. Our level of understanding, design, and technology is such that no building now needs to be a net consumer of energy – rather most buildings can be designed and constructed to produce more energy than they consume.

6) There is need for a regional permanent cleanup industry using innovative technologies to remove, recover & recycle, and reduce the volumes, mobility, and toxicity of contamination in our environment in order to fully restore contaminated lands to their highest use and value in accordance with people's visions for their community free from contamination of: air, land, water, homes, places of worship, businesses, and workplaces...

   This is currently economically and technologically possible but lacks leadership and support in sectors necessary for its development and implementation.

   South Chicago, Illinois and Northwest Indiana has, according to the USGS, an estimated 21 trillion cubic yards of waste fill from over a century of heavy industrialization in the Region.

This can either be chronic source of toxic & hazardous poisons within our communities or it can be a tremendous resource for raw materials in revitalized industries including a permanent cleanup industry as part of a Green New Deal that addresses current toxic emissions, eliminates legacy toxic contamination and greatly lower emissions of greenhouse gas emissions while providing good jobs, green jobs...

Sincerely;

[redacted], [redacted], Hebron, Indiana 46341, [redacted]

References:

See: [https://www.nirpc.org/wp-content/uploads/2017/05/2017-2.2-U.S.-Smelter-Lead-Refinery-USS-Lead-Superfund-Site-Presentation.pdf] 'U.S. Smelter and Lead Refinery (USS Lead) Superfund Site Zones 1, 2, & 3 Update' U.S EPA, January 28, 2017

See: [https://www.nwitimes.com/news/local/lake/expert-chemical-change-likely-contributed-to-lead-in-water/article_0fa0787b-d607-5242-b460-aad1e5e1e7b9.html] 'Expert: Chemical change likely contributed to lead in water' by Sarah Reese, nwi.com, April 16, 2017

See: [https://www.nwitimes.com/news/local/lake/east-chicago-can-t-use-rate-hike-for-lead-pipe/article_cf20c49a-4ab3-501c-aa04-d3f45a55c954.html] 'East Chicago can't use rate hike for lead pipe removal' by Lauren Cross, nwi.com, December 28, 2016

See: [https://www.in.gov/idem/cleanwater/files/ccc_backflow_prev_manual.pdf] [https://www.in.gov/idem/cleanwater/2531.htm] 'Cross Connection Control & Backflow Prevention Manual' Indiana Department of Environmental Management (IDEM), 2016

See Video at 2 minute, 30 second mark: [https://vimeo.com/70892379] 'Dredging Indiana Harbor' Detroit Drone Aerial Video

See Video at 2 minute, 15 second mark: [https://www.youtube.com/watch?v=s0ebGRRG2lg] 'Indiana Harbor Dredging'

See: [https://www.epa.gov/sites/production/files/2015-07/documents/ldu05.pdf] 'Land Disposal Units'

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See: [http://www.sciencedirect.com/science/article/pii/S0160412009000300] & [http://dx.doi.org/10.1016/j.envint.2009.01.015] 'Polychlorinated biphenyls in the surficial sediment of Indiana Harbor and Ship Canal, Lake Michigan' by Andres Martinez, Karin Norström, Kai Wang, and Keri C. Hornbuckle

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June 26, 2019

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RE: U.S. Environmental Protection Agency and East Chicago, Indiana

Hello, welcome to East Chicago, Indiana where a toxic crime against humanity in the West Calumet Housing Complex also know as Operable Unit 1 (OU1) Zone 1 took place – where people of color were deliberately located upon known contaminated land without their knowledge – and Benjamin Lesniak Jr. Executive Director of the East Chicago Housing Authority said "the public housing projects are being built in areas which are predominantly Negro and Latin," and East Chicago mayor Nicosia — a medical doctor — arranged for them to take an option on the West Calumet property" – the site of a Lead products manufacturing plant.

Please understand that not only is the United States Environmental Protection Agency (U.S. EPA) doing an inadequate job of communicating Human Health Risks to communities in Northwest Indiana like East Chicago but they along with other federal and state agencies have failed to protect the Human Health of residents of Northwest Indiana from the threats posed by toxic and hazardous wastes in their communities on a daily basis…

The Indiana Department of Environmental Management (IDEM) and U.S. EPA have known about the Public Health Threats from numerous toxic and hazardous wastes in East Chicago since at least 1985.

Since then generations, many from conception on…, have been directly exposed to multiple toxins in their homes, schools, churches, businesses and parks from contaminated: dust, soil, drinking water, and groundwater…! And they have suffered the resulting toxic insults ranging from birth defects and learning disorders to chronic effects like cancers, autoimmune diseases, and infant mortality.

U.S. EPA has affirmed in their 2014 Responsiveness Summary for the USS Lead Superfund Site Record Of Decision (ROD) that: "The residential portion of the USS Lead Site is located within an Environmental Justice community that is already home to several disposal facilities. Further disposal at the USS Lead property, immediately adjacent to the southern edge of OU1, would increase the environmental burden already born by the residents of OU1." This was when OU1 was one Zone. Obviously this was not U.S. EPA's thinking when they constructed the CAMU or added more toxic wastes to the unpermitted dumps at the DuPont Site in the Calumet community of East Chicago, Indiana...

At the adjacent former DuPont Site where U.S. EPA, using their RCRA Corrective Action authority, dug up, transported, and disposed of both Listed & Characteristic Hazardous Wastes closer to residents homes in the community. This on-site dump was suppose to undergo Closure in the 1980s when interim RCRA status was lost by DuPont but is still operating today as an IDEM conditionally exempt landfill which cannot meet any minimum requirements for: location, design, construction, and/or operation of a toxic or hazardous land disposal facility under current laws and regulations.

People in the Calumet community are being impacted by contaminated groundwater entering their home's basements and local flooding events.

U.S. EPA has inexplicably modified the area of the USS Lead Superfund Site by excluding the former Carrie Gosh School that is still used by adults and children even though U.S. EPA's previous illustrations of the Superfund Site show this and adjacent areas within the footprint of the former Anaconda Lead Products facility and aerial reconnaissance surveys indicate industrial use/landfill deposition in this area over time...

"The Anaconda Copper Company was located on the area now occupied by the Gosch Elementary School and a public housing residential complex (the southwest portion of OU1). The Gosch Elementary School and the East Chicago public housing complex were built on the former Anaconda Copper Company site after 1959." – CH2M, 2013

U.S. EPA ignores clear evidence of on-going releases of toxic & hazardous wastes and vapor intrusion hazards from subsurface wastes, contaminated groundwater, and deep buried debris from historic primary metals processing and pesticide manufacturing facilities...

"Based on the findings of the subsurface investigation, exposure pathways were identified onsite. Specific hazards identified include subsurface soils, groundwater and soil vapors." – 'Phase II Environmental Site Assessment for the West Calumet Housing Complex' Amereco Engineering, February 15, 2017

Additional evidence of on-going releases of toxic & hazardous substances is provided by Tetra Tech's 2015 Grand Calumet River/Indiana Harbor Canal Feasibility Study sampling results which confirm high levels or "hot spots" for toxic Metals and PCB contamination in surface sediment samples ([i.e.] recently deposited) in the Indiana Harbor Canal directly adjacent to the former West Calumet Housing Complex, Goodman Park, and Carrie Gosh School in Zone 1.

U.S. EPA has arbitrarily and capriciously argued both for and against on-site/off-site disposal & *in-situ/ex-situ* chemical stabilization for excavated wastes in their responses to public comments from the community concerning the USS Lead Superfund and DuPont sites whenever it supports U.S. EPA's selected remedies or final decisions...

"The excavation and transport of such large quantities of material pose significant threats to human health and the environment. This is due to the possibility of exposure from airborne dust from removal or transportation accidents resulting from the many truckloads of material that must be removed." – U.S. EPA's Response to Public Comments on the USS Lead Superfund Site CAMU, June 1996

"...risks can be mitigated by implementing a project-specific health and safety plan, keeping excavation areas properly wetted to reduce the creation of dust, planning truck routes to minimize disturbances to the surrounding community, and other best management practices." – U.S. EPA's Proposed Record Of Decision Amendment for the USS Lead Superfund Site, November 2018

"The recommended corrective measures with respect to the site conceptual model and remedial action objectives are summarized as follows:" "In-situ treatment of soil below the water table within the source area excavations where saturated soil concentrations warrant treatment will further reduce the arsenic source to groundwater." – Excerpt of U.S. EPA's Statement Of Basis for the DuPont East Chicago Facility, November 2017

"Alternative 5 was eliminated because there is insufficient evidence supporting the long-term effectiveness of *in-situ* stabilization." – U.S. EPA's Proposed Record Of Decision Amendment for the USS Lead Superfund Site, November 2018

Also U.S. EPA has recently approved a permit for a 180 acre PCB dump in East Chicago, Indiana – the Indiana Harbor and Canal Confined Disposal Facility (IHC CDF). The IHC CDF is located less than one-half mile from: city parks, residential neighborhoods, East Chicago's Central High School, and the new Carrie Gosh Elementary School – relocated from the USS Lead Superfund Site...

The IHC CDF cannot meet any minimum requirements for location, design, construction, and/or operation of a land disposal facility under the law.

"The cancer risk due to inhalation exposure to CDF emissions is estimated to be 2.3 x 10-6 (2.3 in 1,000,000). Based on air monitoring data, the total estimated cancer risk due to air toxics inhalation exposure from other sources in the area (i.e., without including CDF emissions) for 30 years is estimated to be 3.1 x 10-4 (3.1 in 10,000 or 310 in 1,000,000)." – Harold Henderson

At this point how can anyone believe that U.S.EPA is really protecting public health and the environment in East Chicago, Indiana? U.S. EPA destroyed any credibility upon the approval of the 180 acre IHC CDF's TSCA PCB disposal permit next to East Chicago's Central High school and the relocated Carrie Gosch elementary school.

The action undertaken by US EPA fail to eliminate the environmental and human health threats posed by all the known contaminates present within the USS Lead Superfund site by:

1) leaving vast quantities of toxic wastes, known sub-surface contamination & contaminated debris, and contaminated groundwater in place in the Calumet neighborhood of East Chicago, Indiana;

   "Based on the findings of the subsurface investigation, exposure pathways were identified onsite. Specific hazards identified include subsurface soils, groundwater and soil vapors." – 'Phase II Environmental Site Assessment for the West Calumet Housing Complex' Amereco Engineering, February 15, 2017

2) further spreading 4,000 truckloads of toxic contamination to another community for land disposal – what community will be the recipient of these toxic and contaminated wastes? – will this land disposal site be a future Superfund site?;

3) squandering millions of Responsible Party and U.S. Taxpayer dollars on an impermanent Cleanup that fails to achieve a permanent solution using alternative treatment technologies "to the maximum extent practicable" with "reductions in volumes, mobility, and toxicity" of toxic & hazardous wastes;

4) spending millions of dollars to throw away valuable and strategic resources including: antimony, arsenic, cadmium, chromium, copper, gold, iron, lead, manganese, selenium, silver, tin, zinc, beryllium, dysprosium, erbium, europium, gallium, gadolinium, hafnium, neodymium, platinum, praseodymium, and tellurium present in the contaminated wastes, soils, and groundwater...

U.S. EPA and IDEM have approved the use mixing and diluting other materials with the toxic and contaminated wastes in a treatment scheme <u>that will also make it more difficult to recover these resources in the future</u>. This being done in order to ensure passage of the Toxicity Characteristic Leaching Procedure (TCLP) test required for land disposal. Otherwise most of these toxic wastes are banned from land disposal under current federal and state standards.

The mixed waste is declared no longer hazardous and land disposal takes place without any proof of the long-term effectiveness in preventing migration of persistent toxic contaminates from the landfill. Toxic Metals by their very nature are Elements that do not breakdown over time. This practice violates Land Disposal Restrictions (LDRs) for Listed Hazardous Wastes and persistent organic pollutants.

U.S. EPA's Mixture Rule makes it illegal to mix Listed Hazardous Wastes to avoid regulation under federal law. And Listed Hazardous Wastes are known to have been present in the USS Lead Superfund site…

5) not achieving a permanent solution to the threats from toxic contamination in the USS Lead Superfund site including leaving out entire communities (Gary, Hammond, and other parts of East Chicago, Indiana) located outside the current boundaries of the USS Lead Superfund site that have been shown to be impacted by the toxic contamination;

   The size of the USS Lead Superfund site should not be modified by a decrease in area by this ROD Amendment – which excludes the former Carrie Gosh School that is still used by adults and children. This ROD Amendment should instead expand the USS Lead Superfund site to include all known areas impacted by its toxic contamination including other parts of East Chicago, Hammond, and Gary, Indiana as illustrated by numerous documents already in the Administrative Record including the studies of Air Dispersion Modeling and Historical Aerial Photography Review of the USS Lead Superfund site. The potential exposure routes and sources of contamination include: contaminated soils, contaminated groundwater, buried sub-surface waste, toxic vapor intrusion, and contaminated dust within homes, schools, churches, businesses, etc.

6) ruling out other known Metal contaminates and entire classes of pollutants such as Polynuclear Aromatic Hydrocarbons (PAHs), Furans, and Dioxin known to be produced from the industrial processes such as Blast Furnaces, Smelters, and Metals Refining, etc. that historically occupied the USS Lead Superfund site as

sampling results have found contaminates at elevated levels in soils and groundwater within and adjacent to the USS Lead Superfund site

"The ten elements identified at levels generally exceeding average crustal abundances and that are plotted on Figures 6-1 through 6-20 are antimony, arsenic, cadmium, copper, iron, lead, manganese, selenium, tin, and zinc." "In addition to lead, the metals antimony, arsenic and cadmium were found to be present at levels that exceed human health screening values such as the U.S. EPA Region 9 Preliminary Remediation Goals (PRGs) and relevant State criteria." – 'Characterization of the Lead and Other Metals in Soil in the vicinity of the USS Lead Site, East Chicago, Indiana' TechLaw, Inc., September 8, 2004

U.S. EPA concluded that; "PAH contamination in OU1 does not appear to be site-related; rather. It seems to be indicative of a highly industrial urban residential area. For that reason, PAHs are not considered a COC for OU1." – Joan Tanka, Chief, Remedial Response Branch 1 Superfund Division, U.S. EPA Region V, May 9, 2012

Amereco Engineering prepared a Phase II Environmental Site Assessment for the West Calumet Housing Complex dated February 15, 2017 which states that; "…multiple Polynuclear Aromatic Hydrocarbons were identified in exceedance of Indiana Department of Environmental Management (IDEM) Remediation Closure Guide (RCG) Residential Direct Contact (RDC) Screening Levels (SLs) and Soil Migration to Groundwater (MTG) SLs in subsurface soils. Please be advised that metals were also identified in subsurface soils in exceedance of IDEM RCG SLs for MTG, Residential and Industrial direct contact. Additionally, Lead and Arsenic were identified in exceedance of IDEM RCG Excavation Worker Direct Contact SLs in subsurface soils. Concentrations as high as 45,000 mg/Kg and 5,200 mg/Kg, respectively were identified" and

"…benz(a)anthracene was identified in groundwater sample WCG-014 in exceedance of the IDEM RCG SLs. Both samples were collected from soil boring SB-14 advanced in the location of the historic oil pump room. The historic oil pump room was identified on the historic Sanborn Maps to the southeast portion of the site. A release has been confirmed onsite and is suspected to be associated with the historic oil pump room and operations." (continues…)

U.S. EPA's own studies show that secondary Lead smelters using Blast Furnaces had the highest Toxic EQuivalency (TEQ) values for Dioxin and Dioxin-like compounds when compared to reverberatory and rotary furnaces…

7) using biased calculations to establish health risk and cleanup levels for the USS Lead Superfund site – for example: this ROD Amendment is based upon risk calculations and an established cleanup level for Arsenic calculated using an original background level of 14.1 mg/kg (ppm) that was subsequently revised to 26 mg/kg (ppm) in 2016;

   the arithmetic mean concentration in 106 soil samples collected within 500 kilometers of Chicago for Arsenic is 6.56 mg/kg (ppm) or background level according to the United States Geological Survey – USGS Water-Resources Investigations Report 03-4105 'Concentrations of Polynuclear Aromatic Hydrocarbons and Inorganic Constituents in Ambient Surface Soils, Chicago, Illinois: 2001-02';

   "The site specific background concentration for arsenic in soils at the USS Lead site has been determined to be 26 milligrams of arsenic per kilogram of soil (mg/kg)." – 'Justification for Using Site-Specific Arsenic Background Concentration in Soil for Indoor Dust Screening Concentration for the USS Lead Site' by Keith Fusinski, PhD Toxicologist, US EPA Superfund Division, Remedial Response Branch #1, Science and Quality Assurance Section, U.S. EPA Region V, December 13, 2016;

8) using suspect screening and cleanup levels measured with XRF Technology to screen soil samples and bare excavated soils… The Work Plans for this ROD Amendment, as has been done elsewhere throughout the USS Lead Superfund site, utilize XRF Technology contaminate screening levels of 400 mg/kg Lead not the more protective recommended cutoff level of 235 mg/kg Lead;

"The lowest XRF sample results sent for laboratory confirmatory analysis were samples X36/S12 and X66/S20, with XRF values of 549 ppm and 586 ppm, respectively. The laboratory results for those samples (see Table 2) were 31.5% and 59.5% higher than those values. It is therefore recommended that XRF results as low as 235 mg/kg for lead be viewed with caution as possibly being over the 400 ppm screening level." – Final Report on X-Ray Fluorescence Field Study of Selected Properties in Vicinity of Former USS Lead Refinery Facility, East Chicago, Indiana' by Michael J. Mikulka, P.E. Field Project Manager and Mirtha Capiro, Project Manager, U.S. Environmental Protection Agency Region 5

Sincerely;

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RE: Approval for PCB Risk-Based Disposal of sediment containing polychlorinated biphenyls (PCBs) in the Indiana Harbor and Canal Dredging Project by USACE under the Toxic Substances Control Act (TSCA) 15 U.S.C. § 2605 (e) (1).

"We strive to balance our congressionally mandated navigation mission with our commitment to water quality." – USACE Chicago District

At Indiana Harbor and Canal (IHC) the United States Army Corps of Engineers (USACE) has struggled since 1975 (42 years) on a Plan that fails to recognize that their congressionally mandated mission now involves both navigation and environmental quality – that those mandates are not mutually exclusive – and that cost & navigation are not the only considerations...

TSCA / RCRA / CERCLA / SARA

Toxic Substances Control Act (TSCA): TSCA regulates the storage and disposal of PCB wastes containing concentrations over 50 ppm. Nationwide approximately 58 PCB disposal facilities have been approved by U.S. EPA.

Resource Conservation and Recovery Act (RCRA): "RCRA regulates how wastes should be managed to avoid potential threats to human health and the environment."

Comprehensive Environmental Response, Compensation, and Liability Act or Superfund (CERCLA): "CERCLA, on the other hand, comes into play when mismanagement occurs or has occurred (i.e., when there has been a release or a substantial threat of a release in the environment of a hazardous substance or of a pollutant or contaminant that presents an imminent and substantial threat to human health)"

Superfund Amendments and Reauthorization Act (SARA): SARA requires U.S. EPA to give preference to and use permanent solutions and alternative treatment technologies "to the maximum extent practicable" with "reductions in volumes, mobility, and toxicity" of the wastes.

A Risqué RISK-BASED DECISION

The USACE, U.S. EPA, and IDEM will undoubtedly want to limit consideration of comments only to the Risk-Based Disposal Approval PROCESS itself but the project as a whole including: the ECI Site & Confined Disposal Facility (CDF) site conditions, CDF construction history, and CDF & Dredging operational problems already experienced should inform and impact this permitting decision also…

Contrary to USACE's "Maintenance Dredging" claims and due to the nature and characteristics of the "heavily contaminated sediments" in the Indiana Harbor and Canal (IHC) this proposed TSCA permit approval is part of environmental remediation actions and restoration efforts in the Grand Calumet River Area of Concern (AoC) with natural resource damages and impacts to human health and our environment in Northwest Indiana.

The USACE is culpable in creating a deep sediment trap within the IHC… Deeper and more highly contaminated sediments exist in the IHC because during World War II the dredging done by the USACE was almost twice as deep as the authorized navigational depths in some locations of the IHC. The USACE should not be allowed to leave these more highly contaminated sediments in place and should be required to dredge the IHC to a clean bottom.

Indiana Harbor Plants Turning Lake Into Sewer for Industry

TRIBUNE reporters have visited cities on the shores of Lake Erie to report how pollution has brought death to one of the Great Lakes. Now the report focuses on conditions that threaten Lake Michigan, a priceless asset to Chicagoland.

BY CASEY BUKRO

A stream of poison pours into Lake Michigan from the Indiana harbor—a contender as champion of polluted waterways.

"The main source of infection going into the lake is the Indiana harbor," said Robert J. Bowden, chief of the Calumet area surveillance project of the Federal Water Pollution Control administration.

Big Dose of Pollution

Indiana harbor receives staggering doses of industrial pollution from the Indiana harbor canal and the Grand Calumet

Save Our LAKE

river. The Indiana harbor empties into Lake Michigan.

These waters stand as an open indictment of Indiana Calumet area industry. The waters cry for help.

"These are the sewers for industry here. That's the way they use waterways," said Bowden.

Bowden Proves His Point

To prove his point, Bowden took a team of TRIBUNE pollution investigators on a 20-mile sampling run by boat and by truck, starting with an inspection of Indiana harbor.

Our first encounter with gross pollution came in the Inland Steel company slip, just inside the harbor. Trapped in this inlet was a floating island of oil and grease.

"I've seen that kind of oil fill the end of this slip for a distance of 30 or 40 feet," said Bowden. When the winds shift, this mass contamination floats into Lake Michigan.

This reporter stuck his hand into that floating mess to make

[Continued on page 2, col. 2]

[TRIBUNE Staff Photo: By [illegible]]

This loathsome mess covered hand of William Jones, Tribune reporter, after he withdrew it from Cuyahoga river in Cleveland.

[TRIBUNE Staff Photo: By [illegible]]

Casey Bukro, Tribune reporter, dipped his hand into oil covered waters in Indiana harbor in East Chicago with this result.

New G.O.P. Anti-Dumping Bill

BY ROBERT HOWARD
[Chicago Tribune Press Service]

Springfield, Ill., Sept. 16—Two Republican legislators announced today that another attempt will be made to outlaw the pollution of Lake Michigan by the dumping of harbor and river dredgings.

Sen. Arthur R. Gottschalk [R., Flossmoor] prepared for Senate introduction Monday a revised version of an anti-dumping bill, which was vetoed by Gov. Kerner after it passed the legislature in June under the sponsorship of Rep. Carl L. Klein [R., Chicago].

"The Republican party must see to it that Lake Michigan does not die," said Gottschalk, chairman of the legislature's advisory commission on economic development.

"Pollution is an emergency problem, and while the legislature is in session, we should give the governor a chance to change his mind."

Democrats in the House of Representatives on Tuesday blocked Klein's attempt to

Continued on page 2, col. 7]

Chicago Tribune reported Casey Bukro famously dipped his hand in IHC waters…

A study to evaluate the toxicity of sediments from the Grand Calumet River and Indiana Harbor Canal found "…that sediments from this assessment area are among the most contaminated and toxic that have ever been reported."

A The USACE's $247 million Plan has ongoing deficiencies & problems including: location, design, construction, operation, dredging practices & procedures, and technology deployed. This Plan does not constitute a cleanup or remedial action plan to eliminate threats & risks to human health and Northwest Indiana's environment…

"Because this is a maintenance dredging project, dredging can occur only to the authorized depth of 22 feet, though in places contamination is as deep as 40 feet. In future years, there will be the potential to remove Toxic Substance Control Act (TSCA) materials from the canal. TSCA sediments are defined by the presence of high concentrations of more dangerous substances, including PCBs and heavy metals. Several smaller hot spot locations have been found from environmental sampling. After being dredged, these locations will require additional preventive maintenance to prevent the release of contaminants." – USACE

So the USACE's Plan does nothing to fully address the known threats to Northwest Indiana, the community of East Chicago, Indiana or Lake Michigan, a source of drinking water for millions of people, posed by the risks associated with the "heavily contaminated sediments" in the IHC as it only removes 55% of the toxic contamination in some locations and exposes layers of sediment known to have higher levels of toxic and/or hazardous contaminates.

This Risk Based Permit Approval is arbitrary & capricious; violates the intent, spirit, and letter of the laws and regulations of the United States of America and State of Indiana including but not limited to: the Toxic Substances Control Act (TSCA), the Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response and Compensation Liability Act (CERCLA) or Superfund, Superfund Amendments and Reauthorization Act (SARA), is contrary to the Department Of Defense's (DOD) & U.S. Army's own environmental regulations, policies, and programs, does not adequately consider or address hazards & risks to human health and the environment, lacks due diligence, and must be denied or modified to require a permanent solution using combinations of available innovative treatment technologies to reduce the toxicity, mobility, or volume of toxic chemical and/or hazardous dredging wastes because:

The USACE must not be allowed to utilize the excuse of Maintenance Dredging to avoid requirements of the intent, spirit, and letter of state, federal, DOD and U.S. Army environmental laws, regulations, and policies by making compliance decisions solely upon the lowest possible costs and then seek approval from U.S. EPA and IDEM for a 160 acre TSCA land disposal facility next to two schools, a city park & golf course and residences in East Chicago Indiana which is in midst of a LEAD Crisis already.

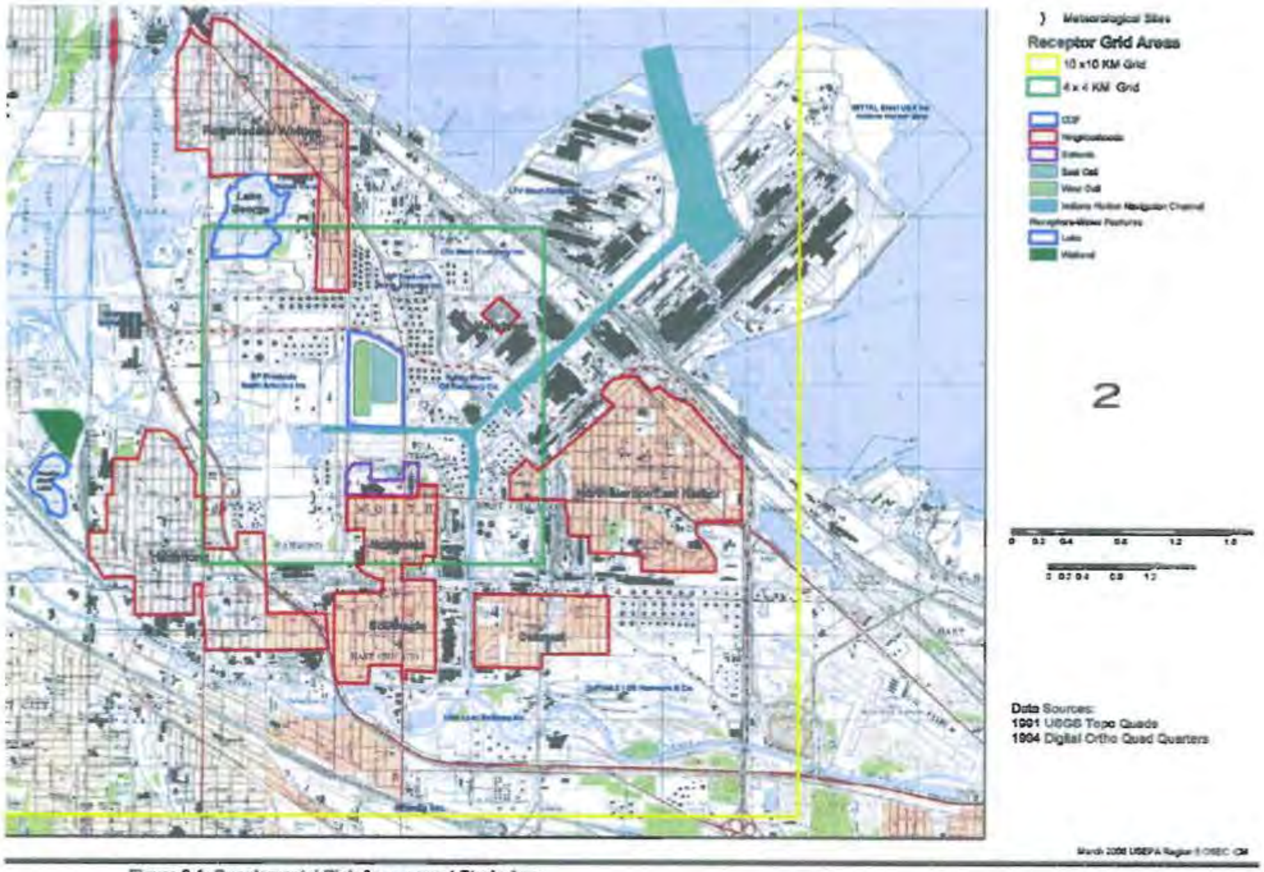


Figure 6-1: Supplemental Risk Assessment Study Area

Supplemental Risk Assessment (SRA) Map showing Indiana Harbor CDF proximity to Northwest Indiana's lakes, schools, parks, and residential neighborhoods...

The approval is based upon flawed assumptions & modeling of risks to human health and impacts to Northwest Indiana, the community of East Chicago, Indiana, and Lake Michigan's environment.

The risk assessment uses Powderhorn Lake instead of closest local bodies of water such as Lake George etc, for 'Margin of Exposure Estimate for Average Daily Dose of Dioxin in Resident Adult'

"Risk assessment methodology has major limitations, often yields imprecise estimates, and produces numbers that very much depend on who does the work. Using seemingly the same methodology, people working for the government or a responsible party can analyze a site and produce estimates of risk differing by a factor of 10 or 100, or even more." – U.S. Congress, Office of Technology Assessment

Human health risk estimations and real time monitoring & operational response actions have been over simplified to a single surrogate chemical: Naphthalene – a solid at ambient temperatures that undergoes sublimation – a chemical with different physical properties than the normal evaporation for the majority of the known Volatile Organic Chemicals (VOCs) present in the IHC's "heavily contaminated sediments" along with those same contaminates present in soils, floating free phase hydrocarbon layers, and groundwater at the ECI Site & unlined USACE Confined Disposal Facility (CDF).

The CDF Land Disposal Site was not adequately investigated, assessed, or remediated prior to use as a CDF…

The grossly contaminated ECI Site was not cleaned up underground prior to CDF Construction.

Failure to consider the hazards & risks of exposure to known contaminates migrating off-site due to inadequate RCRA Corrective Actions at the ECI Site & CDF before CDF construction and during current operations of the CDF including failure to control known plumes of migrating contaminates.

In the spring of 2015, oiled and dead ducks were observed in West (Lake George) Branch of the IHC. The Northwest Indiana Times reported that: "The old ECI site has petroleum product leaching from the property into the canal," Barry Sneed, spokesman for the Indiana Department of Environmental Management, said."

Hazards & risks from underground conditions at the ECI Site & CDF including: grossly contaminated soils, up to 10 foot thick free phase hydrocarbon layer, floating free product containing PCBs that sampled up to 850 ppm in concentration (existing unaddressed TSCA waste), Phenol contamination discovered at 750,000 ppm, contaminated groundwater with VOC concentrations sampled up to 2,130 mg/L, and pre-existing infrastructure such as sewers, underground storage tanks, underground process vessels, pipelines, utilities, etc were not adequately identified, remediated, or properly considered in approving this permit. This includes future subsidence caused by deteriorating underground infrastructure left in place under the CDF.

"The sample with the PCB concentration of 850 mg/kg was collected from MW-6, located by the canal at the southern end of the property." – USACE

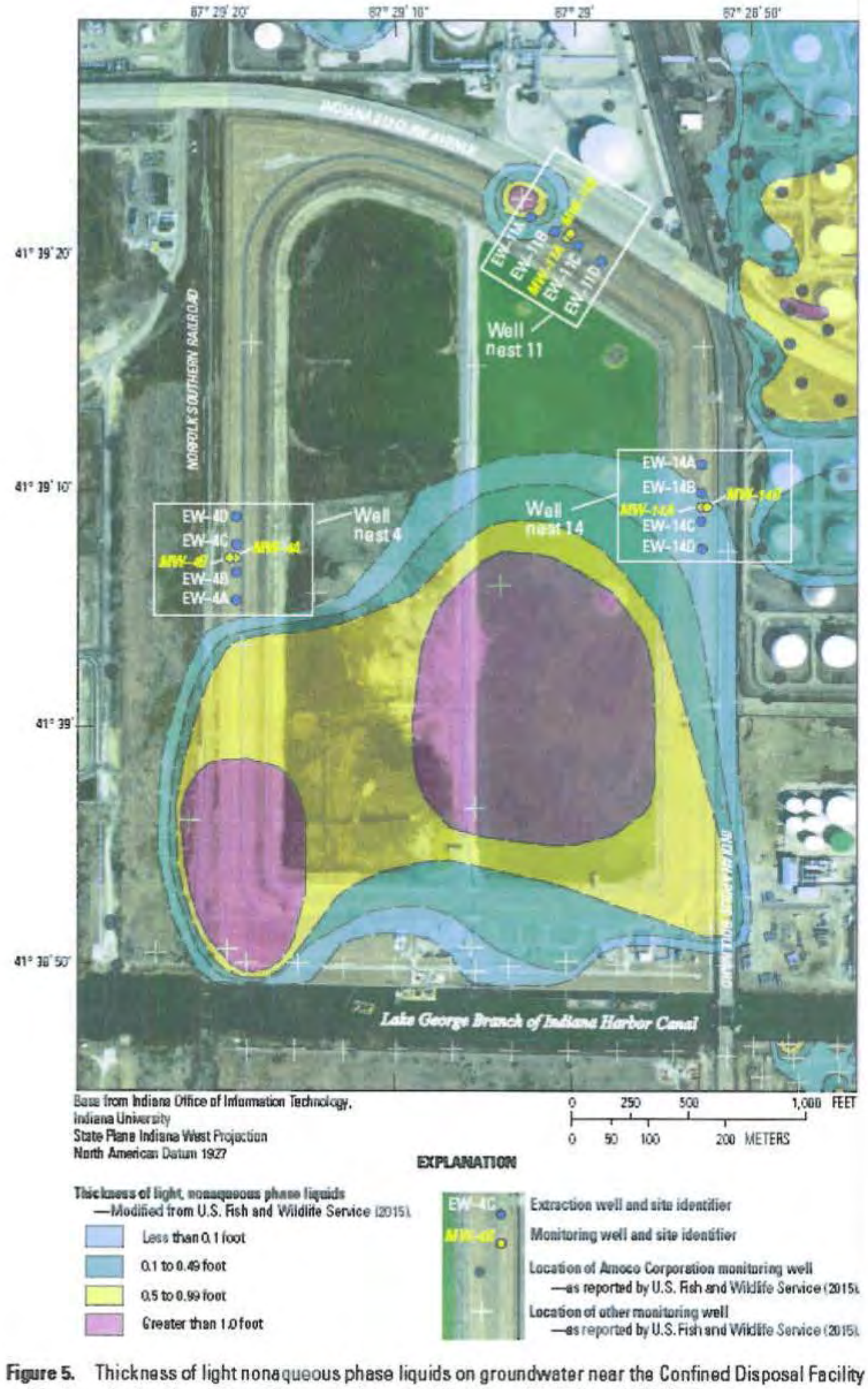


Figure 5. Thickness of light nonaqueous phase liquids on groundwater near the Confined Disposal Facility and Indiana Harbor Canal, East Chicago, Indiana (modified from U.S. Fish and Wildlife Service, 2015). Data represented on the figure were collected prior to 1998.

Hazards & risks from sources of potential contaminate release and routes of exposure during dredging activities and CDF operations were all lumped into an unproven premise and undocumented conclusion that the CDF's emissions dwarf consideration of any other sources of exposure such as dredging location, debris removal & disposal, CDF cell water pumping, groundwater extraction, and waste water treatment plant operations were not quantified or adequately considered.

Emissions of Volatile Organic Chemicals and PCBs will increase due to mixing with air.

Failure to consider impacts to contaminate emissions and hazards & risks from changes in USACE's planned dredging and unlined CDF operations including:

- CDF design changes to two large unlined cells;

- discharge of groundwater extraction wells to the CDF's unlined cells;

- use of CDF's influent wastewater as dredged waste disposal process water;

- unexpected increases in dredged debris handling and washing;

- slurrying of dredged wastes for hydraulic placement;

– ponded CDF operation impacts on the Waste Water Treatment Plant (WWTP);

– ponded CDF operation impacts on the hydrogeology of the Calumet Aquifer;

– unexpected decreases in several extraction wells capacity and pump failures; and

– unexpected reduction of inward groundwater gradient and difficulties in maintaining necessary capacity for groundwater extraction during dredging operations.

"Dredged sediment varies from clay to oily sediments, but most is a sloppy muck, laced with tons of debris that was not expected prior to the start of the project."

"This excavator unloads the dredged material into a third barge topped by a steel woven mesh, which catches the debris, allowing the sediment to drop into the wet well beneath."

"After trial and error, the correct mesh size was discovered, and a manifold system that sprayed water across the mesh washed most of the sediment into the wet well."

USACE's contaminated CDF Water fed Manifold Spray & Excavator Bucket washing of "highly contaminated sediment" as a crude separation technology for Debris.

"Periodically, the excavator loads the debris into an adjacent hopper barge, which when full is moved to a nearby crane pad and unloaded into seven-cubic-yard front end loaders, which dump the debris into the CDF. During the 2012/2013 seasons, more than 4,000 tons of debris was found in 400,000 cubic yards of dredged sediment."

Thousands of tons of Debris including tires (Indiana Code 13-20-14 states that: "A whole waste tire may not be disposed of at a solid waste landfill") are routinely open dumped into the Indiana Harbor CDF.

Splash goes the Debris into an oily sheen upon the West cell of Indiana Harbor CDF.

"…electric pumps pull water from the CDF into the hopper barge, where two submersible pumps create the slurry"

"…low levels of PCBs have been detected in the groundwater treatment plant influent water from the groundwater gradient system (i.e., in groundwater pumped from the site perimeter). Aroclor 1248 has been detected at concentrations of 0.28 – 0.29 µg/L, while Aroclor 1260 has been detected at 0.27 µg/L." – USACE

"Because the east cell receives groundwater from the groundwater gradient system, and the groundwater contains petroleum compounds, it can be seen that the organic compounds are somewhat higher in the east cell…" – USACE

The USACE has yet to finalize a design or install a final operational Waste Water Treatment Plant (WWTP) thus making it difficult, if not Impossible, to determine hazards & risks from WWTP emissions… Significant VOC and other Hazardous Air Pollutants (HAPs) have been observed from WWTPs at oil refinery operations and this source should not be dismissed without further investigation and quantification of threats to human health and the environment.

"Because no treatment of the pond water has occurred, the actual package treatment plant is not on site. A package plant will be provided when needed" – USACE

The expanded CDF's two cells ponds are large enough to have whitecaps in high wind events and storms this wave action could disturb toxic and/or hazardous dredged wastes and will create aerosols from the untreated pond water as will hard rain events and hail storms. The unsupported conclusions that ponded cell CDF operation will reduce particulate emissions to zero are false under these common metrological conditions near Lake Michigan and the hazards & risks to human health and the environment were not considered.

"Using the relationship between wind speed, U, and aerosol flux, F, for marine environments, $\mathrm{Log}(F) = 0.099U - 0.73$, derived by ***Geever et al.* [2005]**, and from the droplet size spectrum of ***Woolf et al.* [1987]**, we estimate that for a moderate wind speed of 5 m/s, the volume flux of evaporating droplets is 1.9×10^{-8} L m^{-2} s^{-1}. For a persistent organic pollutant such as PCBs, with an average lake water concentration of ~0.2 ng L^{-1} [***Offenberg et al.*, 2005**]," – 'Aerosol Production from the Great Lakes' Surface by Slade, J. H., Mwaniki, G., Bertman, S. B., Vanreken T. M., and Shepson, P. B., American Geophysical Union, Fall Meeting 2009.

Figure 2. Location of the Confined Disposal Facility, monitoring and extraction wells on the property, extraction wells with petroleum contamination identified from well boring logs, and wells for well nests 4, 11, and 14 that were included in this study. The groundwater cutoff wall is approximately 12 feet outside the location of each extraction well and in between the inner and outer monitoring well locations.

It fails to adequately consider impacts to contaminate emissions and hazards & risks from increased PCB and PAHs volatilization due to exposure of sediments with even higher levels of toxic and/or hazardous contamination from decades ago…

"In general, the PCB concentration increased with increasing depth." – USACE

"…a previous UI study that found the release of PCBs from the sediment floor to the water above, and then, to the air. This time, scientists drilled down into the floor of the canal and discovered that the concentration of PCBs buried within the sediment is even higher.

We found that the deeper you go, the more toxic it is," said Andres Martinez, a UI postdoctoral scholar in civil and environmental engineering and lead author of the study. "Dredging the IHSC has the potential to expose these more toxic sediments."

"The canal already contributes a significant amount of polychlorinated biphenyls (PCBs) to East Chicago's air. And that load of pollution could skyrocket as the Corps dredges into deep sediment, said Keri Hornbuckle, a professor at the University of Iowa's department of civil and environmental engineering.

"I'm not as worried about the dredging process itself, but what they could leave behind on the surface," Hornbuckle said. "That's the stuff that will get into the air."

"If the underlying sediment is twice as concentrated with PCBs as the surface sediment they're getting rid of, then it's likely the airborne levels will double" in East Chicago, Hornbuckle said."

"But Hornbuckle said PCBs are readily transformed into a gas. The canal already emits about 15 pounds of PCBs into the air every year, according to Hornbuckle's 2011 study.

Ron Hites, a professor at Indiana University's School of Public and Environmental Affairs who specializes in air monitoring in the Great Lakes basin, agreed with Hornbuckle, saying PCBs on surface waters become airborne.

People are usually exposed through eating tainted fish, but PCBs can be inhaled, too."

It underestimates risks to human health and our environment by not considering the CDF's additive, cumulative, and synergistic impacts to elevated ambient levels of existing pollution in Northwest Indiana, the community of East Chicago, Indiana, and Lake Michigan.

It adds risks to human health and our environment and finds it acceptable to increase emissions from the ECI Site and CDF according to the USACE's Comprehensive Manage Plan (CMP) worse-case estimates by 50 percent for particulate pollution…

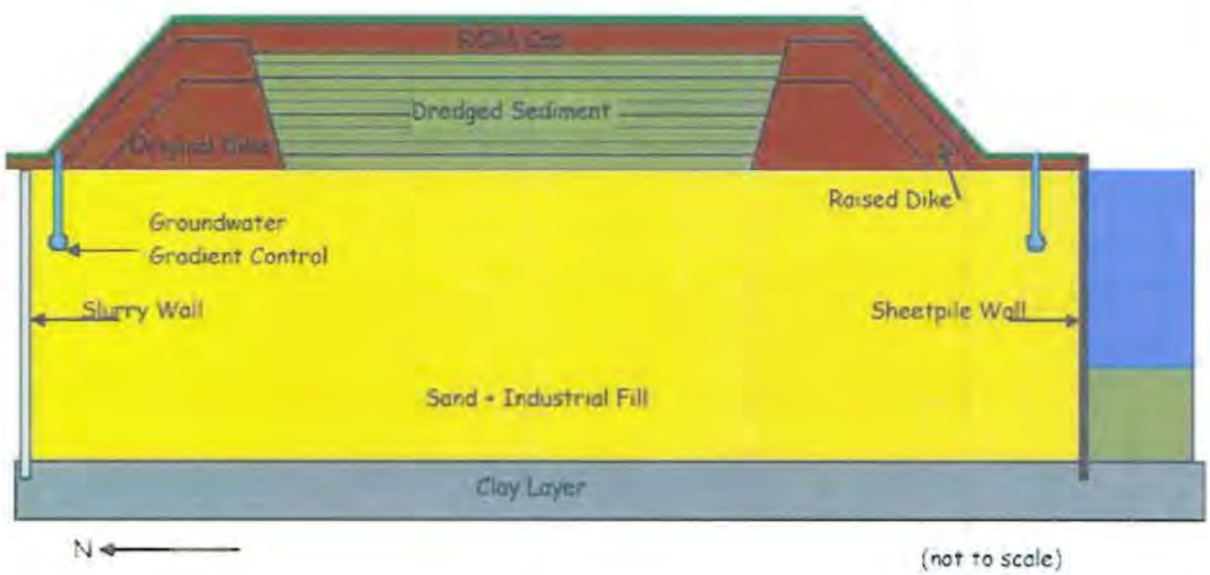
"That dust may be mixed with three times more PCBs than the dust from the existing site, four times more benzene, five times more toluene, five times more chromium, and ten times more arsenic." – Harold Henderson

It approves land disposal of toxic and/or hazardous substances in an unlined CDF facility that could not otherwise be approved because it neither was designed for nor meets current design and construction standards for a toxic chemical waste landfill / toxic chemical waste impoundment or hazardous waste landfill / hazardous waste impoundment under state and federal laws & regulations applicable to toxic and/or hazardous waste land disposal facilities.

It approves land disposal of toxic and/or hazardous substances in a facility that does not meet state or federal requirements for locating a toxic chemical waste landfill / toxic chemical waste impoundment or hazardous waste landfill / hazardous waste impoundment.

It approves land disposal of toxic and/or hazardous substances in a facility that is constructed above grossly contaminated soil, floating free phase hydrocarbons and contaminated groundwater which is completely ignored and unaddressed in the USACE's Plan and real world CDF operations.

It approves land disposal of toxic and/or hazardous substances in a facility that is constructed above two recently discovered (during slurry cutoff wall construction) underground pipelines crossing the ECI Site & unlined CDF that are of unknown: condition, ownership, or content and were deliberately left in place under the site along with other "Industrial Fill" by USACE posing undetermined hazards & risks and compromising containment structure integrity at an estimated 1 gallon per minute rate…



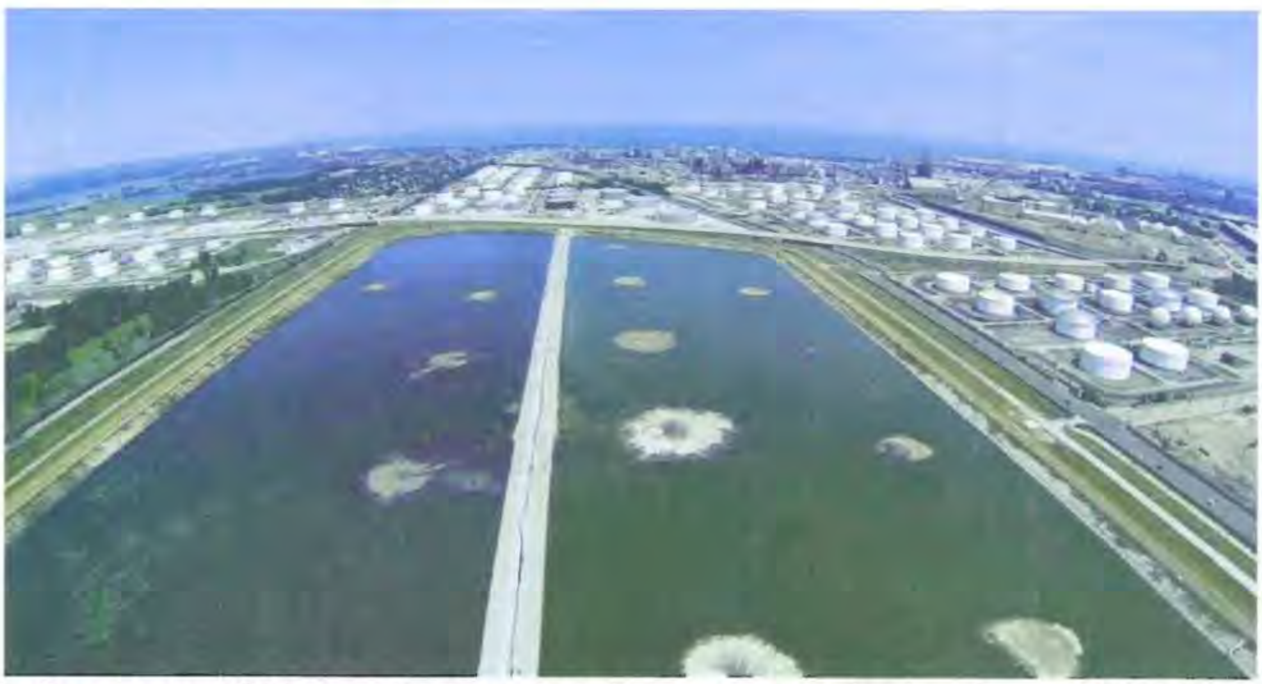
"Industrial Fill" (pre-existing infrastructure) and pipelines (not shown) were left in place.

It approves land disposal of toxic and/or hazardous substances in a facility that is constructed without any liner – synthetic and/or clay, and leachate collection system.

It approves land disposal of toxic and/or hazardous substances in a facility that cannot meet the DOD's and U.S. Army's own requirements for toxic, chemical, or hazardous waste land disposal.

It approves land disposal of toxic and/or hazardous substances in a facility that cannot be adequately or conventionally monitored as the CDF's boundaries are arbitrary and are constrained by existing infrastructure surrounding the ECI Site – thus the CDF's containment structures do not encompass the entire area of known gross contamination on and off the ECI Site – making it is nearly impossible to establish groundwater monitoring wells to determine CDF leakage when all monitoring wells are located and screened in the same areas of gross contamination.

It approves land disposal of toxic and/or hazardous substances in a unlined CDF land disposal facility that was constructed piecemeal using different contractors and material sources at different times at the lowest costs and solely relies upon a containment strategy consisting of 6% bentonite clay and sand slurry cutoff wall, inward groundwater gradient pumping scheme, earthen clay dikes, and eventual RCRA cap after an estimated 30 years of open dumping operation to prevent any migration of toxic and/or hazardous substances into the community of East Chicago, Indiana…



Indiana Harbor CDF on a calm day – Note the exposed dredged wastes and CDF size. Obviously ponded CDF operation does not reduce particulate pollution to zero…

It sets a precedent by turning an entire USACE Confined Disposal Facility (CDF) into a fully fledged TSCA toxic chemical land disposal facility. A CDF facility that's designed to dewater and consolidate dredged sediments as quickly as possible to make more room for additional dredged wastes somehow has met the stringent design and construction standards for a Toxic Substances Control Act chemical land disposal facility or Resource Conservation and Recovery Act hazardous waste land disposal facility and in doing so create one of the largest TSCA toxic chemical dumps on a Great Lakes tributary – the IHC.

Approval of the TSCA permit does not ensure risk reduction because it fails to eliminate hazards & risks by implementing an impermanent solution leaving the toxic wastes in place with no reduction in toxicity and depends upon a containment strategy with perpetual maintenance & costs and institutional controls near schools, parks, and residences in the highly populated area of Northwest Indiana.

The only sure way to ensure risk reduction is to eliminate the hazard.

Infrared Photograph of Indiana Harbor and Canal and area surrounding the CDF.

"Moving hazardous waste from one hole in the ground to another is the non-solution that was behind SARA's preference for permanent cleanup." – U.S. Congress, Office of Technology Assessment

"OTA considers that a site has been permanently cleaned up when the contamination that was the cause of high enough risk to warrant cleanup (either current or future risk) is rendered irreversibly harmless through destruction (e.g., incineration or biological treatment) or recovery and reuse of the hazardous substances (e.g., recovery of lead from contaminated soil and buried battery casings)" – U.S. Congress, Office of Technology Assessment

The USACE says that; "Mixing will likely be limited to the first three inches of non-TSCA sediment placed to encapsulate the TSCA sediment."

Thus the volume of polychlorinated biphenyl (PCB) contaminated sediments will increase – clearly an opposite direction from the intent of United States Congress under SARA stressing "the importance of permanent remedies and innovative treatment technologies in cleaning up hazardous waste sites" "with reductions toxicity, mobility, or volume of cleanup wastes."

The U.S. EPA, under SARA Section 121 is required to "take into account:"

– "long-term uncertainties associated with land disposal;"

– "short and long-term potential for adverse health effects from human exposure;" and

– "future remedial action costs if the alternative remedial action in question were to fail."

SARA states that U.S. EPA shall:

1) "Select a remedial action that . . . utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable," and,

2) If this is not done, "publish an explanation as to why a remedial action involving such reductions in the toxicity, mobility, or volume of the hazardous substance, pollutant, or contaminant was not selected."

So the intent of Congress is clear that simple open dumping of toxic and/or hazardous substances is an unacceptable risk to human health and the environment and should require treatment of wastes prior to land disposal…

The USACE also wound up choosing a disposal technology by default – the cheapest way possible using open dumping of untreated wastes in their CDF on the cheapest location found in decades – an unmitigated active RCRA/CERCLA site in an abandoned oil refinery on the IHC.

Waste management regulations prohibit open dumping of solid waste in Indiana but that is essentially what USACE is doing with the dredged wastes from Indiana Harbor and Canal...

TREATMENT & PERMANENCE

Leaving heavily contaminated toxic industrial wastes behind – it is not a permanent remedy to protect people's health or the environment...

No innovative treatment technologies to destroy, reclaim, and reduce toxicity, mobility or volume here – just remove and dump straight-up into a permitted disposal site is the anticipated deal...

What started as an estimated 14,000 cubic yards of TSCA level waste has ballooned to 60,000 cubic yards now and "It is requested that the IHC CDF be permitted to allow up to 200,000 cyd of TSCA regulated sediment, with a maximum concentration of 100 mg/Kg, to be placed in the CDF over its operational lifetime."

For 42 years the USACE has had time to develop and implement innovative technologies for achieving permanent solutions that reduce the toxicity, mobility, or volume of the hazardous substance, pollutant, or contaminant but by now it should be obvious that the USACE does not want to do that and seeks only to achieve the lowest cost solution to navigational maintenance dredging and the disposal of wastes generated...

"The Lake Michigan Federation, Save the Dunes Council, Grand Calumet Task Force, and Sierra Club Great Lakes office organized a 15-member "technical advisory committee" that included academics from the University of Illinois, Chicago State, DePaul, and the University of Wisconsin" and "pointed out that not nearly enough samples of sediment had been analyzed to determine the overall chemical composition and what treatment was possible. The corps replied that it didn't need to know; the analysis that had been done was "clearly sufficient for the design of a navigational dredging project. The project is not a remediation effort.""

"The advisory committee succeeded in improving the project in one way. The corps agreed to publicly review the technical dredging and disposal literature at least every five years and "use all reasonable efforts" to take advantage of any advances. The corps reportedly accepted this provision only after local U.S. representative Peter Visclosky--the ranking member of the energy and water development subcommittee of the House Appropriations Committee--twisted arms at the highest level." – Harold Henderson

The USACE investigated 18 innovative treatment technologies and dismissed everyone as not cost effective or unable to treat all contaminates with one technology…

The USACE gave up early and as often as possible on any treatment technology that cost more than simply open dumping in a CDF stating: "Significant time and funds would have to be expended for further development before these technologies could be applied on this scale." I guess 42 years wasn't enough time and I never knew that the U.S. Army had so much problems spending money…

However, the USACE has chosen a separation treatment technology during recent dredging operations by default…

Due to USACE's poor characterization of the IHC's contaminated sediments it is now necessary to improvise a crude separation technology for unexpected amounts of debris from IHC dredged wastes by using large screens in open barges and washing CDF influent wastewater over dredged wastes by the excavator bucket full and pressurized hose manifold – the cheapest way possible to deal with the mess and perhaps the most risky also…

Forty-two years is such a long time to waste resources playing the administrative approval game over and over by USACE on failed attempts to first open dump dredged wastes in a CDF constructed in Lake Michigan – dubbed "Toxic Island" and now on land CDF still without any treatment of the wastes whatsoever…

Combinations of treatment technologies were never evaluated since individual treatment technologies were summarily dismissed as too expensive or unable to treat all contaminates in the dredged wastes from IHC.

An example of a combined treatment technology strategy could use separation technologies during hydraulic dredging to remove debris, concentrate heavy metals, and separate organic wastes followed by super critical water oxidation to destroy organic contaminates and metals recovery and/or fixation to prevent leaching…

Elimination of organic pollutants like PAHs, PCBs, Furans, Dioxins, etc lowers risks to human health and our environment. There are no known safe exposure levels for Dioxin and many of the pollutants known to be present in IHC dredged wastes…

"...use of better, but often more expensive technologies, is limited by decision makers who are overly cautious, have poor information, or are primarily interested in minimizing front-end costs." – U.S. Congress, Office of Technology Assessment

"Impermanent remedies, which provide less protection than permanent ones and do not assuredly meet cleanup goals, are often selected purely because they are cheaper in the short run; in the long run they are very likely to be more expensive." – U.S. Congress, Office of Technology Assessment

A few indicator compounds, used to represent all site contaminants for risk assessment, may be inappropriate for technology evaluation because physical and chemical properties may differ from the way health effects vary. The result can be a poor technology choice. Also, site sampling may be insufficient to detect hot spots of contamination that would facilitate using limited treatment to cut cleanup costs. In addition, groundwater monitoring may not be reliable." – U.S. Congress, Office of Technology Assessment

U.S.C. Title 10, Subtitle A, Part IV. Chapter 160, Section 2701 directs the Secretary of Defense for the Department of Defense (DOD) and therefore the USACE to: "carry out a program of environmental restoration at facilities under the jurisdiction of the Secretary" known as the Environmental Restoration Program (ERP) and establishes the Responsibility for Response Actions at: "Each facility or site owned by, leased to, or otherwise possessed by the United States and under the jurisdiction of the Secretary."

Note: "USACE is authorized to operate and maintain a navigation project at Indiana Harbor in East Chicago, Lake County, Indiana, to allow for passage of ship traffic in the harbor and shipping canal." This project includes the CDF.

"The Program Goals "shall include the following:

(1) The identification, investigation, research and development, and cleanup of contamination from a hazardous substance or pollutant or contaminant.

(2) Correction of other environmental damage (such as detection and disposal of unexploded ordnance) which creates an imminent and substantial endangerment to the public health or welfare or to the environment.

(3) Demolition and removal of unsafe buildings and structures, including buildings and structures of the Department of Defense at sites formerly used by or under the jurisdiction of the Secretary."

The U.S. Army is a member of the Federal Remediation Technologies Roundtable (FRTR) which was created to: "to bring together top federal cleanup program managers and other remediation community representatives to:

- Share information and learn about technology-related efforts of mutual interest,
- Discuss future directions of the national site remediation programs and their impact on the technology market,
- Interact with similar state and private industry technology development programs, and
- Form partnerships to pursue subjects of mutual interest."

So where is USACE's technology development program in the case of the Indiana Harbor CDF dump and pump TSCA chemical waste landfill permit?

crickets

In fact the U.S. Army has an "Army Environmental Command (AEC) with responsibility that includes: "restoration of contaminated lands, pollution prevention, technology transfer, reporting and tracking of Army programs, conservation of natural and cultural resources, and compliance with environmental standards and criteria."

more crickets

After decades without technological progress USACE is still clamshell dredging and open dumping “heavily contaminated sediments” from IHC…

“What does a permanent cleanup mean to an ordinary person? It means that more studies, tests, and cleanup will not be needed, unless the most unexpected and unpredictable event occurs.

In terms of safety, permanence means that people living near Superfund sites do not have to worry about exposure to toxic chemicals left in their community.

People understand that some sites are very complicated and that new information obtained during the cleanup process may force significant changes.

But people rightly lose confidence when they are told it is safe and effective to leave toxic waste in the ground and cover it up with soil, or to bury untreated toxic chemicals in a landfill, or to let groundwater slowly flush contaminants into a river.” – U.S. Congress, Office of Technology Assessment

"Cost-benefit thinking allows nearly any kind of cleanup decision to be rationalized and undermines the environmental goals of Superfund. Cost-benefit reasoning backs up the selection of impermanent remedies because of excessive flexibility in cleanup goals." – U.S. Congress, Office of Technology Assessment

"Impermanent remedies results in: "Spending on cleanup remedies which are unlikely to be permanent, leading to more spending in the long term for re-cleanups and perhaps posing exposures, risks, and damage to health and environment." – U.S. Congress, Office of Technology Assessment

"...certain kinds of action are inconsistent with permanence, including any form of land disposal or containment, and any use of engineering or institutional controls, including long term monitoring for releases. All of these mean:

1) Site hazardous material remains hazardous;

2) There is uncertainty about releases of hazardous material and, therefore, risks to health and environment; and

3) There are a host of uncontrollable possible future events which might compromise the effectiveness of the protection.

Some important examples of problems are: deed restrictions which later are forgotten, ignored or overturned; physical failure of caps on buried waste which goes undetected or, even if known about, is not effectively and expeditiously dealt with by repair or replacement because of lack of money or confusion over who has responsibility; new commercial or residential uses of land or water which were not anticipated and which cannot be blocked legally; natural catastrophes, such as flooding of a capped landfill or a lightening hit on a leachate treatment system; monitoring systems which may fail, may not be operated properly, may not be properly maintained with required sensitivities, and may not be responded to with fast and effective remedial action. – U.S. Congress, Office of Technology Assessment

"...OTA disagrees with the notion that land disposal or engineering or institutional controls provide a "degree of permanence." What varies is the level of protection provided by different cleanup technologies and methods, not the degree of permanence. To tell the public that a remedy is permanent for perhaps a decade does not build public confidence." – U.S. Congress, Office of Technology Assessment

"Organic hazardous substances can be destroyed by supplying enough energy to break chemical bonds, such as through incineration or biological activity, and through chemical reactions, such as dechlorination, ultraviolet photolysis, wet air oxidation, and supercritical water oxidation. Materials containing toxic metals can be treated to recover the metals, converting them back into their original commercially valuable form. Even some organic hazardous substances can be recovered and sold commercially; recovery of oil from refinery waste sludges and contaminated soils is commercially available through various solvent extraction processes, Acidic or alkaline wastes can be chemically neutralized. Asbestos can be classified. Therefore, in terms of scientific principles, destruction, recovery, or some form of chemical conversion are treatment approaches that produce permanent cleanups." – U.S. Congress, Office of Technology Assessment

The following is a possible hierarchy of Preferred cleanup technologies and methods:

Class I: Destruction or Recovery-Actual destruction of hazardous organic substances to irreversibly eliminate the source of the problem. Examples: thermal, biological, and some chemical treatments (e.g., dechlorination). Recovery of pure metals or chemicals suitable for commercial use.

Class II: Separation Followed by Destruction – Technologies which separate hazardous from nonhazardous materials. Examples: extraction or stripping of volatile chemicals from soil or groundwater, gas venting, soil washing and flushing, precipitation, and carbon absorption of contaminants from groundwater.

Class III: Stabilization – Any form of chemical fixation, stabilization, and solidification which cannot assure actual destruction of all hazardous components. There are numerous commercial forms which vary according to the materials mixed with the hazardous material. In some cases there are claims that organic molecules are permanently altered by the process, but this has not been well documented scientifically. Effectiveness and reliability for toxic metals are well proven.

Class IV: Engineering Controls – A variety of methods can restrict the movement of contaminants or exposure to them. Although such methods are not permanent, they can recontrol a site by: 1) imposing physical barriers (e.g., slurry walls, landfill caps and liners, leachate or groundwater pumping); 2) keeping water away from hazardous material (e.g., diversion ditches, soil and plastic covers, storage vaults); and 3) keeping people away from hazardous material (e.g., fences, caps, and soil covers). Techniques in this class must be assessed routinely for failure or deterioration of materials. Repair and maintenance, as well as less than 100 percent effectiveness, pose unavoidable uncertainties. Onsite re-disposal of hazardous material, followed by engineering controls, provides more reliability than applying controls to hazardous material in their original condition (e.g., buried waste or taminated soil).

Class V: Institutional Controls – These depend on people and organizations to deal indirectly with hazardous contaminants by controlling exposures to them or by detecting the need for further action (e.g., restrictive deeds; alternate water supplies; relocation of residents; periodic monitoring, testing, or inspection). Unavoidable uncertainties result from:

I) potential failures of people or institutions to adequately fund or implement the controls, and

2) possible changes in the original cleanup objectives without public accountability.

Class VI: Natural Treatment – Any onsite or no-action approach which depends on a natural form of treatment being effective over the long-term (comparable to time over which hazardous properties persist) for expected but inevitably uncertain site conditions and future land and water use. Includes: natural biodegradation, chemical breakdown or decay of hazardous molecules, adsorption to soil. Dilution and dispersion of hazardous Substances into the environment which produce "safe" concentrations maybe considered by some people as natural treatment or attenuation." – U.S. Congress, Office of Technology Assessment

Russell E. Train, former EPA Administrator, stated the importance of permanent cleanups: "Haunting Superfund is the nightmare of spending millions to clean up a site, then discovering the cleanup is far from permanent."" – U.S. Congress, Office of Technology Assessment

SARA requires U.S. EPA to give preference to and use permanent solutions and alternative treatment technologies "to the maximum extent practicable" – there are no permanent solutions and alternative treatment technologies presented by the USACE in their application for this permit or in IDEM's and U.S. EPA's conditions for approval of it.

SURROGATE CHEMICAL & CONTAMINATE EXPOSURE ASSUMPTIONS

The USACE considers "...Naphthalene, the most significant Hazardous Air Pollutant (HAP) to be emitted" – USACE

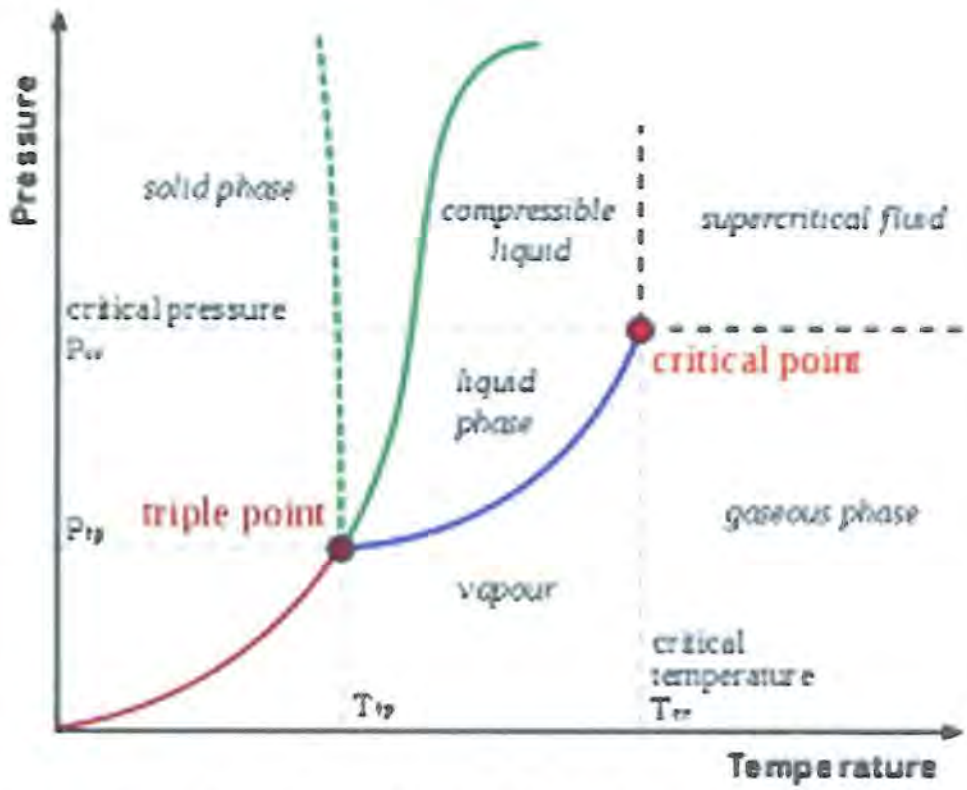
"Benzene and toluene were the second and third most frequently detected organic compounds" – U.S. Geological Survey

"Benzene and the named alkyl benzenes are characterized by relatively high water solubilities, high vapor pressures, and low negative-log octanol-water partition coefficients. This characterization indicates that the compounds tend to volatilize into the atmosphere and into unsaturated zone air." – U.S. Geological Survey

Naphthalene has: a Boiling Point of 424° F at 760 mm Hg; a Vapor Pressure of 0.05 mm Hg at 68° F; and a Vapor Density of 4.42 (Relative to Air)

By comparison Benzene has: a Boiling Point of 176.2° F at 760 mm Hg; a Vapor Pressure of 76 mm Hg at 68° F; and a Vapor Density of 2.77 (Relative to Air)

Benzene has a Vapor Pressure 1,520 times greater than Naphthalene…



Typical Phase Diagram for Physical Properties

"Volatilization from the water table of organic contaminants that are generally lighter than water can reduce contaminant concentrations in ground water. Volatilization-related losses from ground water involves exchange of the compound from the water into the air in the unsaturated zone, and diffusion out of the unsaturated zone into the atmosphere. Volatilization is dependent on site factors including soil porosity, moisture content, unsaturated-zone permeability, and climatic conditions such as barometric pressure and temperature. Volatilization also depends on the vapor pressure of the organic compound as measured by its related property, the Henry's Law constant (Smith and others, 1988). The higher the Henry's Law constant, the more volatile the compound." – U.S. Geological Survey

"The interpretation of which processes affect contaminant transport is complicated by the physical properties of the most concentrated contaminants. For example, some contaminants are lighter or denser than water and are present in sufficient concentration to be present as a separate phase from water (a nonaqueous phase liquid or NAPL). A NAPL can be a solvent for other organic compounds and can transport them in concentrations that exceed their solubility in water." – U.S. Geological Survey

In fact, IDEM replaced Naphthalene as a toxicological surrogate for three of the aromatic fractions for Total Petroleum Hydrocarbon (TPH) Extended Range Organics (ERO) analysis for Risk Integrated System of Closure (RISC) in 2009.

"This new approach breaks down the composition of specific petroleum products into chemical groups, called fractions, based upon carbon chain length and similar physical/chemical properties." – IDEM

"The fractionation approach addresses these complications by dividing the hydrocarbon mixture into several fractions that are sufficiently homogeneous with respect to physical and chemical properties. A surrogate compound, (or a mixture with characteristics similar to the fraction), on which adequate toxicological information exists, is selected to represent each fraction. That surrogate is then used to estimate the potential human health risks posed by that fraction. The individual risks of each fraction are then totaled to evaluate the overall risk of the hydrocarbon product." – IDEM

"The indicator chemical should be similar in terms of environmental fate, transport, persistence, and inherent toxicity to the chemicals it is to represent, and should not be used for special environmental routes, such as the food pathway exposure route." – Richard A. Becker, Ph.D., DABT

"Justification for selection of surrogate chemicals should include qualitative or quantitative consideration of environmental mobility, persistence, and bioaccumulation." – Richard A. Becker, Ph.D., DABT

"Known human carcinogens (i.e., classified by the U. S. EPA in weight-of-evidence Group A, or by International Agency for Research on Cancer (IARC) in Group I), known human developmental toxins, and known human reproductive toxins may not be eliminated from a quantitative human health risk assessment, even if the indicator chemical selection procedure indicates that such elimination is justified." – Richard A. Becker, Ph.D., DABT

"[U.S.] EPA says much the same thing about air pollution. The agency concluded that at worst the operation might cause 2.3 cancers per million people breathing the air nearby for 30 years. That number has been criticized, and a new one is on order, but the final number will still be tiny compared to the cancer risk of simply breathing East Chicago's air as it is for 30 years--310 in a million, according to some studies. (The lifetime risk in southwest and southeast Chicago is about 200 in a million, according to the EPA.) Their point is that the CDF adds little to an already bad situation. "CDF emissions are small," says the EPA, "less than one percent" of the pollution found in 1989 and '93 studies of comparable south Chicago neighborhoods." – Harold Henderson

"There is no safe level of exposure to dioxin" – U.S. EPA

"The dioxin exposures estimated to occur from CDF are much lower than the national background averages, so the estimated dioxin pollution released from the CDF is not expected to increase health risks." – U.S. EPA Supplemental Risk Assessment

ECI SITE & CDF CONDITIONS

The Sinclair Refinery now USACE CDF site.

The unlined CDF was literally built on top of the old refinery, and chemical & pesticide production locations with no RCRA Corrective Action or other remediation prior to construction.

ECI Site Tank Farm just prior to demolition.

An arbitrary boundary of 50 feet inside the property's perimeter was selected for the 30 inch wide 6% bentonite clay and sand underground cutoff slurry wall for the West, North, and East sides of the CDF. The south side, also the natural direction of groundwater flow, along the West (Lake George) Branch of the IHC has steel sheet piling with bentonite clay seals.

"When I began my work at the site, free product was seeping into the adjacent water way. The site was being managed by the bankruptcy court. I worked with the Indiana Department of Environmental Management, the City of East Chicago and the Army Corp to install a shore length free product removal system and worked to prepare the site for a Confined Disposal Facility that would hold contaminated dredge material from the adjacent Indiana Harbor Canal." – Marilyn Guthrie, Lead Project Engineer, ARCO Products Co.

ECI Site during demolition of above ground infrastructure.

"In December 1989 the city of East Chicago took over the ECI property for back taxes, only to find that it had acquired a hot potato. The site hadn't been properly cleaned up and was in violation of the federal Resource Conservation and Recovery Act. Pipes full of petroleum products remained belowground, and the ground itself resembled an oil-soaked sponge. In 1991 soil samples from 16 feet underground exuded "a strong petroleum odor." The year before, the Coast Guard had found oil flowing from the site into the Lake George branch of the canal, requiring emergency corrective action. The ECI site still has surprises left in it: in November 2003 a contractor preparing it for the CDF came across two pipes that traverse the property more than 20 feet below the surface. Nobody knows to whom they belong or what's in them; the current plan is to work around them." – Harold Henderson

Groundwater characteristics found in the area where ground water commonly discharges to the Grand Calumet River, the Indiana Harbor Canal or Lake Michigan include: "The 10 most frequently detected trace elements" which "were arsenic, lead, chromium, nickel, cyanide, zinc, selenium, cadmium, mercury and copper" and "The 15 organic compounds that were most frequently detected in all samples were phenol, benzene, toluene, bis (2-ethylhexyl) phthlate, methylene chloride, xylene, acetone, ethyl benzene, naphthalene, methylethyl ketone, dibutyl phthalate, trichloroethene, 4-methylphenol, benzoic acid, and 2,4-dimethylphenol." – U.S. Geological Survey

"Limited available data collected between 1992 and 1996 also indicate the presence of light-nonaqueous phase liquids floating on ground water under large areas between the Lake George Branch and Lake Michigan, with thicknesses ranging from less than 0.1 ft to more than 10.6 ft." – U.S. Geological Survey

"Two wells showed PCB concentrations greater than 50 ppm in the free-phase hydrocarbon layer. Results from the ERM report are summarized in Appendix I of the attached Design Documentation Report (USACE, 1999). These two locations are on the southern side of the site, within a few hundred feet of the canal, and approximately midway between the east and west boundaries." – USACE

ECI Site demolition included dumping left over refinery, chemical, and pesticide production wastes in unlined impoundments situated in wetland areas along the West (Lake George) Branch of IHC making groundwater monitoring for CDF leaks almost impossible in the area's grossly contaminated Calumet Aquifer.

Soil borings detected five distinct layers [under the CDF]:

Layer 1: consists of 0 to 12 feet of fill consisting of sand, cinders and slag contaminated with free-phase hydrocarbons.

Layer 2: Calumet Aquifer, most likely the Atherton Formation, consists of 20 to 25 feet of medium dense to dense gray, silty, course to fine sand (SM) which is heavily contaminated with free-phase hydrocarbons. The hydraulic conductivity for this layer ranges from 1.6 x 10 to the minus 3 cm/sec to 8.4 x 10 to the minus 3 cm/sec.

Layer 3: consists of 60 to 65 feet of stiff, dark gray silty clay (CL) which probably formed as part of the Valparaiso Moraine. The hydraulic conductivity for this layer ranges from 1.1 x 10 to the minus 8 cm/sec to 1.9 x 10 to the minus 8 cm/sec.

Layer 4: consists of approximately 16 feet of extremely dense, gray and olive course to fine sand or hardpan, possibly of the Lagro Formation.

Layer 5: consists of gray dolomitic limestone bedrock with a hydraulic conductivity of 1.2 x 10 to the minus 4 cm/sec. The bedrock is moderately hard, moderately to slightly weathered and slightly fractured.

"The underlying silty clay is considered to act as an effective confining layer to the vertical movement of groundwater." – USACE

"Although the net ground-water exchange between the Calumet aquifer and the confining unit is relatively small, the vertical gradients indicate that more ground water flows downward from the Calumet aquifer into the confining unit than flows upward from the confining unit into the Calumet aquifer." – U.S. Geological Survey

CDF LOCATION

In general land disposal facilities are not allowed to be located on top of pipelines…

In Indiana you're not allowed to even locate the boundary of a Municipal Solid Waste Land Fill (MSWLF) within "Two thousand six hundred forty (2,640) feet from a public or nonpublic school." – 329 IAC 10-16-11 Setbacks (Note: 2,640 feet = one-half mile)

And Indiana Code Title 13. Environment IN CODE § 13-20-12-2 states: "Sec. 2. A person may not establish a sanitary landfill for the disposal of garbage, rubbish, or refuse on land in Indiana within one-half (1/2) mile of an area: (1) that has been subdivided for residential purposes"

CDF CONSTRUCTION

"The first major construction contract was awarded to Environmental Quality Management based on "the lowest price and technologically acceptable proposal," said Monica Ott, project manager with the U.S. Army Corps of Engineers Chicago District, the federal partner in this project." – Northwest Indiana Times, February, 19, 2002.

The 30 inch thick 6% bentonite clay and sand cutoff wall on three sides of the CDF wasn't all built at the same time or same technique and left 4 "deep obstructions" in the slurry wall's path in place underground because it would have added an additional million dollars more to the 247 million dollar project…

"Gaps were initially left in the cut-off wall due to the presence of rail lines across the site. The rail lines were removed and the "cut-off wall gaps" were constructed in a separate contract in 2007. The same permeability requirements were used, although a different construction method was employed." – USACE

"Four deep obstructions, summarized in Table 7-1 and Figure 16, were allowed to remain in place because the cost to remove them was estimated to be in excess of 1 million dollars, the flow through the slurry wall towards the interior of the site as a result of leaving them in place was estimated to be 1 gpm assuming a 2-ft drawdown across the slurry wall by the gradient control system, and the cost to treat the additional water extracted by the gradient control system was estimated to be $3,000/year (USACE, 2005)." – USACE

The slurry wall was located arbitrarily due to existing infrastructure such as Indianapolis Boulevard & Cline Avenue, the West Branch of the Shipping Canal, and cuts in half an area of known "free phase hydrocarbon" contamination floating on top of the groundwater next to the West (Lake George) Branch of the Shipping Canal.

The original steel sheet piling wall on the Shipping Canal failed and a new steel sheet piling wall with bentonite clay seals had to be installed as a method of physically containing the mobile toxic chemical wastes under the ECI site.

"The clay material used to construct the Phase I dikes came from two borrow source locations: Doughman Pit, at the intersection of Clark Road and Ridge Road in Gary, Indiana and Krooswyk Pit located in Griffith, Indiana. Material from Doughman Pit was primarily used to construct Dike 1 and Dike 3 while material from Krooswyk Pit was primarily used to construct Dike 2." – USACE

An illustration of the slapdash engineering and construction at the CDF site occurred "In April 2005, groundwater buildup behind the sheet pile wall on the south end of the site caused the wall to deflect 14-inches from its original location. Temporary well points were installed along the south border of the site to lower the groundwater table and relieve pressure on the south sheet pile wall. The groundwater was pumped through a stop-gap treatment facility provided by USEPA prior to discharge. [It should be noted that the groundwater pressure on the failing old sheetpile wall was a temporary condition created by the installation of the slurry cut-off wall around most of the site, which had the effect of creating a "bathtub" that held precipitation.]" – USACE

"Although engineering technology would indicate that sheet piles are 100 percent effective in blocking horizontal ground-water flow, there is much visual evidence that sheet-pile barriers in the study area are leaky (Jim Smith, Indiana Department of Environmental Management; Dan Sparks, U.S. Fish and Wildlife Service; Scott Morlock, U.S. Geological Survey, oral communication 2000). Metal sheet piles have been corroded extensively in many areas by slag runoff (Bayless and others, 1998)." – U.S. Geological Survey

U.S. Army TM 5-814-7 Hazardous Waste Land Disposal / Land Treatment Facilities states that: "Units designed primarily for the purpose of dewatering without treatment are considered surface impoundments rather than land treatment units." And that

"Double liners are required at all DA installations unless a waiver is obtained from HQ, (DAEN-ECE-G), Washington, DC 20314 US Army Corps of Engineers."

"5-2. Landfills a. Suitable wastes. The primary restriction on landfilling of hazardous wastes is the elimination of liquid disposal. Bulk liquids or sludges with leachable liquids must not be landfilled at DA hazardous waste facilities; disposal of such wastes will be permitted only in surface impoundments"

"5-3. Surface Impoundments b. Disposal constraints. Surface impoundments should be located in a hydrogeologic setting that limits vertical and horizontal hydraulic continuity with ground-water. Surface impoundments should be sited and designed with maximum protection of groundwater provided by liners, and low-permeability underlying soils. The hydraulic head formed in the impoundment provides for a high potential for liquid seepage and subsurface migration."

Under U.S. Army TM 5-814-7, Surface Impoundments require Liner System C, Leak Detection System, Monitoring Wells, Run-on/Run-off Controls, Overtopping Controls, Cap (Final Cover), Closure and Post- Closure Care and Landfills require Liner System C, Leak Detection System, Monitoring Wells, Leachate Collection and Removal Systems, Run-on/Run-off Controls, Wind Dispersal Controls, Cap (Final Cover), Closure and Post- Closure Care

An eventual RCRA Cap is planned to lessen water infiltration into the CDF – except the expanded capacity 40 foot high CDF has a larger surface area than the formerly flat ground surface which actually will increase the amount of water infiltration by comparison.

The CDF does not meet the technical criteria of the Code of Federal Regulations Title 40, Part 34 Land Disposal Restrictions for Hazardous Waste which states:

(1) Chemical waste landfills. Any person using a chemical waste landfill to dispose of PCBs must use a chemical waste landfill that meets the criteria set forth in §761.75.

§ 761.75 Chemical waste landfills. (b) Technical requirements. Requirements for chemical waste landfills used for the disposal of PCBs and PCB Items are as follows:

(1) Soils. The landfill site shall be located in thick, relatively impermeable formations such as large-area clay pans. Where this is not possible, the soil shall have a high clay and silt content with the following parameters: (i) In-place soil thickness, 4 feet or

compacted soil liner thickness, 3 feet; (ii) Permeability (cm/sec), equal to or less than 1 × 10¥7; (iii) Percent soil passing No. 200 Sieve, >30; (iv) Liquid Limit, >30; and (v) Plasticity Index >15.

(2) Synthetic membrane liners. Synthetic membrane liners shall be used when, in the judgment of the Regional Administrator, the hydrologic or geologic conditions at the landfill require such a liner in order to provide at least a permeability equivalent to the soils in paragraph (b)(1) of this section. Whenever a synthetic liner is used at a landfill site, special precautions shall be taken to insure that its integrity is maintained and that it is chemically compatible with PCBs. Adequate soil underlining and soil cover shall be provided to prevent excessive stress on the liner and to prevent rupture of the liner. The liner must have a minimum thickness of 30 mils.

(3) Hydrologic conditions. The bottom of the landfill shall be above the historical high groundwater table as provided below. Floodplains, shorelands, and groundwater recharge areas shall be avoided. There shall be no hydraulic connection between the site and standing or flowing surface water. The site shall have monitoring wells and leachate collection. The bottom of the landfill liner system or natural in-place soil barrier shall be at least fifty feet from the historical high water table.

(4) Flood protection. (i) If the landfill site is below the 100-year floodwater elevation, the operator shall provide surface water diversion dikes around the perimeter of the landfill site with a minimum height equal to two feet above the 100-year floodwater elevation. (ii) If the landfill site is above the 100-year floodwater elevation, the operators shall provide diversion structures capable of diverting all of the surface water runoff from a 24-hour, 25-year storm. (Continues…)

"Some CDFs incorporate liners or steel sheet pile in the dike walls. As dredged material is pumped or placed in a CDF, the sediments settle out and the accompanying water evaporates or percolates through the walls or into the ground. When permeability is reduced over time because of sediment sealing, a variety of water release mechanisms including overflow weirs and filter cells are used." – Steve Thorp, Great Lakes Commission

IHC DREDGING OPERATIONS

"…the Indiana Harbor Canal is dumping into Lake Michigan the equivalent of almost three cubic yards of toxic mud every hour of every day." – Harold Henderson

Current dredging began in 2012 and the facility now holds approximately 1,089,000 cubic yards of "heavily contaminated sediment."

"Dredging began in 2012 and the anticipated dredging schedule is to dredge 200,000 cy of sediment each year until the backlog is removed (approximately 8 years), although this schedule is funding dependent. Approximately 60,000 cubic yards of these sediments is considered to be TSCA-regulated (>50 mg/kg PCBs) or is adjacent to the TSCA-regulated material and to be removed in conjunction with the TSCA-regulated sediment" – USACE

"The mud at the bottom of the canal may be the biggest single source of pollution in southern Lake Michigan--a black, sandy, pungent pudding that's 5 percent oil and grease. It also contains mercury, lead, arsenic, zinc, chromium, benzene, naphthalene, and PCBs--all "legacy pollutants" from the steel mills, oil refineries, and city sewage plants that spent most of the 20th century spewing their wastes with abandon." – Harold Henderson

"Beginning in 1911 the corps dredged 100,000 cubic yards of gunk every year from the canal. Today the channel is supposed to be kept 22 to 29 feet deep, depending on the location. Rumor has it--there don't seem to be any records--that the harbor and canal were dredged deeper during World War II, which is why in some places there's contaminated sediment below the navigation depth.

All this dredged mud had to go somewhere. From 1924 to '66 it was barged out to a 90-square-mile area in Lake Michigan 10 to 20 miles east of Chicago, where it was dumped in about 70 feet of water.

But plenty of toxic mud was left behind. In 1949 the canal contained so much oil that one refinery called it a "dangerous fire hazard." In 1967 not even pollution-tolerant sludge worms could live on the bottom. That same year an oil spill from the canal reached Chicago's water-intake crib off 68th Street." – Harold Henderson

"TSCA sediments below project depth left in the canal will be covered with stone to prevent migration of the material; eventually sedimentation in the channel is expected to bury any remaining TSCA regulated material below the authorized navigation depth" – USACE

"...the TSCA regulated sediment will be mechanically dredged and hydraulically placed in the east cell of the CDF. The CDF will be operated as a ponded facility and the dredged material will be placed evenly to maintain a minimum ponding depth throughout." " – USACE

"Conant (2000) and Lorah and others (1997) note in their studies that the majority of chemical and microbial attenuation of volatile organic contaminants occurred in the last 10 ft of sediment before discharge to a stream or wetland. Removal of this sediment by dredging can disrupt the observed natural attenuation and increase the potential for direct discharge of contaminated ground water to the surface-water resource." – U.S. Geological Survey

"The planned removal of contaminated streambed sediment from the GCR/IHC (U.S. Environmental Protection Agency, 2002d) is a mitigation strategy that may change the hydraulic connection and the associated microbial and chemical processes that inhibit contaminant migration from ground water into surface water. The chemistry of surface water, ground water, and interstitial water in streambed sediment and physical hydrologic characteristics of these locations should be monitored at selected locations after dredging to assess reestablishment of contamination in surface water and streambed sediment." – U.S. Geological Survey

CDF OPERATIONS

"...the CDF is not a permitted TSCA chemical waste landfill or Resource Conservation and Recovery Act (RCRA) hazardous waste disposal facility. The PCB regulations require disposal of dredged material with a PCB concentration of 50 ppm or greater in a permitted TSCA or RCRA disposal facility." – U.S. EPA

There's no liner underneath the CDF. In fact under there's what should have been a massive Superfund Site from the former Sinclair, ARCO, ECI oil refinery and chemical & pesticide production facilities much of the underground infrastructure "such as abandoned petroleum, processed oil and fuel pipes, utilities and underground storage tanks" was left in place including 4 "deep obstructions" 25 to 29 feet deep right in the path of the three foot thick 6% bentonite clay and soil (sand & beach sand) Slurry Cutoff Wall under the site.

USACE estimates are 1 gallon per minute leakage through the Slurry Cutoff Wall because of the "deep obstructions" (pipelines) and have to revise wastewater treatment operational costs because of it. What happens when the pipelines deteriorate is anybody's guess...

There is no Lechate Collection System to control hydrostatic pressure and capture contaminated water from under the CDF.

"The CDF will create environmental problems of its own, as it won't be truly contained until the project ends and it can be capped. For 30 years it will stand open to the elements, and the drying mud will be picked up by the wind. Preliminary worst-case estimates published by the corps and EPA in their January 1999 "Comprehensive Management Plan" suggest that once the dredging and dumping begin, dust pollution may increase by 50 percent. That dust may be mixed with three times more PCBs than the dust from the existing site, four times more benzene, five times more toluene, five times more chromium, and ten times more arsenic." – Harold Henderson

The Groundwater Gradient System will prevent contaminant migration to the Calumet Aquifer and to the Lake George Branch of the canal by maintaining a 2 foot inward groundwater gradient at the site. – U.S. EPA Supplemental Risk Assessment

"Installation of the groundwater cutoff wall will trap groundwater and elevate the groundwater table at the site artificially, resulting in temporary ponding of the site if groundwater pumping does not occur. The sheet pile dock wall along the Lake George Branch of the Indiana Harbor and Canal also acts as a hydrologic barrier to the movement of groundwater, and causes groundwater to build up along the landward side of the wall. The groundwater height is currently approximately 8 to 9 feet above the water level in the canal. The Groundwater Gradient Control System is in operation, with a goal of maintaining an inward 2-foot gradient with respect to groundwater elevation and canal water elevation outside the slurry cutoff and sheet pile walls (see Section 7.1.1.3; as of September 2010, the 2-foot inward gradient had not yet been achieved)." – USACE

""The gradient control system consists of 88 6-inch diameter vertical extraction wells with submersible pumps, approximately 10,521 linear feet of 12-inch diameter ductile iron gravity collection header pipe, two 6-foot diameter precast concrete package lift stations with duplex pumps, 25 standard manholes on the 12-inch header pipe, approximately 1,475 linear feet of force main, 40 monitoring wells, 3 ultrasonic water level indicators, control building, instrumentation and control system, underground power distribution system and electrical work. The system began extracting groundwater to develop a gradient on the site in June 2010. The actual construction completion date was 2012, due to minor construction and equipment issues. A construction documentation report for the system was completed in February 2014." – USACE

Response to EPA on the DuPont Site March 6, 2018

The EPA has not submitted any responses to most of my previous comments and questions. I did not submit these to waste paper or time. I expected a professional response to my statements and a critique where necessary, either in writing or by phone. Obviously, I was mistaken. The current administration, at least at Region 5 ,is not interested in substantive analysis of their actions and proposals, and has taken an egregious, elitist, and arrogant position implying that they are beyond citizen, professional criticism and no reasonable justification is necessary. I object to such a position and herein do so publicly. If you are planning to use the excuse that for various departmental reasons you have not been able to assign the proper personnel to such a response, I reject such an excuse, because you have had since September of last year to formulate such responses.

Concerning the Proposed Solution to the Toxics at the DuPont Site

You have not shown an understanding of the bioimplications of your proposal. There are at least 220 species of Sulfate reducing organisms (all obligate anaerobes) some of which exist at the DuPont site and could be involved in your proposal. Each organism has some unique requirements to operate optimally. Until you know which ones are involved you are fishing in the dark, with a bare hook and a fishing line made of spaghetti. You will not know what your result mean even if they appear good. Your proposed system, if it works at all depends on the formation of heavy metal and metalloid sulfides and the sequestration of these in a matrix composed of mainly iron III and aluminum III gelatinous hydroxides hydrates. You further assume that these sulfides will be stable and nonreactive. The most probable sulfides will be those of Lead, Antimony, Arsenic, Cadmium,Chromium and iron.
By researching the reports of Parsons, CH2MHill, and additional documents it becomes clear that the primary goal of this work is simply the reduction in the water born concentration of Arsenic. No other toxic, in this witches brew of toxics at DuPont, is considered even though the chosen mechanism will also reduce the toxic concentration of Cadmium , Zinc, and Lead. This mechanism also involves the the copercipitation of Arsenic on a matrix of sulfides, where the primary matrix consists of iron II sulfide. The known complication of the re-solution of Arsenic sulfides by solutions containing excess sulfide ions, explains some of the confusing language of the reports. Furthermore, you have never indicated in any of your presentations that you have both Arsenic III(estimated approx. 66%) and Arsenic V (estimated approx. 33%)at DuPont. These form different sulfides with very different properties, and yet your protocol seeks to sequester both at the same time. The proposed protocol should have indicated this clearly. None of the documents, to my knowledge indicate the spontaneous conversion of As_2S_3 to Arsenic trioxide in the presence of air, which is again soluble and toxic. This factor seriously damages the acceptability and long term reliability of proposed remedy. Furthermore an e-mail was sent to me by Jennifer Dodd which indicated that no sparging with air would be done during the remediation. This is very perplexing to me since the CH2MHill/Parsons protocol is empirical, changing any part of it could materially affect the outcome. Therefore I need to see a copy of the complete protocol to be used.
A further critique is called for about your proposed method. The EPA seems to have accept the work done by VH2MHill and Parsons without a proper evaluation of the protocol.
1. The PRB is based on a synthetic "O" valence iron, nanotechnology, barrier which this steel mill slag is most definitely not. Where is the data tha proves the two are equivalent? They are not
2.No controls were run off site under controlled conditions where the Arsenic levels, microorganisms, pH and other factors could be varied and tested using multfactorial analysis to determine optima.
3. no attempt seems to have been made to identify the end point sulfides, their location in the system , their concentration, crystal size and uniformity, or estimates of the Ksp's. These are all critical for the long term stability of the arsenic insolubility which impacts the safety of your system vis a vis the people of the region.
4. No measure of threshold interferences in crystal formation which would impact the long term stability of your solution.

5.No attempt was made by the investigators to determine the species or even the genera of the sulfate reducing organisms which they haphazardly used in their development. Without this knowledge, factors such as climate , temperature , pH variability , conductivity,etc..would effect the expected outcome in unknown and unpredictable ways. Since all this work is empirical, changes cannot be compensated for with known results. The site is not a static entity there are inorganic, organic and biological changes occurring constantly how these will affect the long term outcome are unknown. The investigators did monitor the system for a year but they expect it to remain stable indefinitely. Indefinitely is a very long time. One possible source of failure could be photolithotrophic organisms which use sulfide materials as electron donors and convert them back to sulfates This entire remedy is a crap shoot and we all know where the crap will fall. This is being touted as a permanent solution, I see a hundred reasons why it can fail.

Concerning the Natural Area

You, DuPont, and The nature Conservancy claim that the Natural Area, on the DuPont site, is a pristine unaffected ecological remnant of typical Dune and Swale . In my opinion this is not correct. Parsons own valuation of the Natural(2013) area shows concentrations of Arsenic,Lead,and Zinc at unnaturally high levels relative to the published Chicago control levels (within your distributed documents).There are no known natural sources in this areas geology for Lead and Arsenic and Zinc is at unnatural levels. Parson's Baseline Ecological Risk Assessment makes a common assessment error. It massively underestimates the importance of macroinvertebrate life. This group represents close to 90% (estimated by biomass) of all animal life anywhere on dry land(which includes fresh water aquatics). Until this error is corrected all evaluations are skewed and inaccurate. I believe that The Nature Conservancy's evaluation was made primarily on the bases of a rich phytic community. Which is only an indication of potential zoological richness, not a guarantee. The "unimproved areas" of the property were used as a convenient dumping site for almost 100 years by all the businesses located on the site. You will have to show a zoological history to convince me that the Natural Area has not been impacted and you can not do that. I saw no bioindex(Hilsenhoff or other) in any of the documents. Did I miss it, is it there ? That polutants from other areas of the site are infiltrating the Natural Area (NA hence forth) is clearly shown by the data from the 2012 Humane Health Risk Assessment where the waters in the Buffer zone are significantly contaminated again despite the fact that the Buffer zone showed a significant drop directly after the RFI. Clearly one of the drivers of this is the Calumet Aquifer ebb and flow, which will distribute the pollutants laterally and bring any buried materials up from below.

The use of plants for bioremediation is a well documented technique. A problem exists in that different plant bioaccumulate these toxins at different rates and accumulate them in different parts of the plant. The next question is what herbivores will partake of these plants. Meaning these are the primary agents of toxin distribution to the ecotope as frass and food. Since most herbivores are insects in the NA, there is your answer and a justification for doing a complete macroinvertebrate survey. This also requires a thorough investigation of what plants act as accumulators. To the best of my knowledge neither of these factors have been quantified. In my opinion therefore, the real quality of the NA is at best questionable, at worst awful.

Violation of the Laws

I will leave matters of the gross violation of a plethora of laws, rulings and legal stipulations which have been repeatedly and intentionally ignored over long periods of time by the PRP's(Principle Responsible Parties) to those of our teams who are more skilled in the art; but the impact of these violations has negatively impacted the complexity, distribution and all the costs associated with this site. I think that I am safe in assuming that this was done in part, in an effort to reduce overall costs. Nothing could be further from a rational approach. Anyone who knows of the work of W. Edwards Deming knows that this will yield exactly the opposite of what is sought. Focus on costs and your costs will go up and your quality will go down: Focus on quality, and your costs will go down and your quality will go up. Attention to costs is a good thing; focusing on costs is not. Knowing where the dividing line between the two exists is the art of good business.

A More Reasonable, Rational, Remediation for DuPont

All of the efforts expended to date on the DuPont and adjacent inhabited sites have focused on containment not removal and detoxification. Some of the effort has been to dig up and rebury on site, or dismantle and rebury. Aways leaving the pollutants easy transport to inhabited areas. Off-site, there has been a little scraping, digging and cleaning but the material is still reburied somewhere where it can again surface and recontaminate something or someone. Large amounts of money have been wasted with the end results no net gain as the toxic plume slowly spreads ever further into the community. The price tag on all this is outrageous, especially since there is no permanent solution and more money will be needed for a permanent solution.

A partial list of buried toxins consists of :

1. Antimony in various forms with an estimated mass of 80 short tons. Is on the list of strategic materials which this country is running out of and will soon have to import a majority. At $ 8688.00/ton this represents $695040.00
2. Arsenic in various forms with an estimated mass of 126 short tons. This material is an important dopant in the electronics semiconductor industry. At approximately $0.92/lb this represents $231,840
3. Cadmium-one of lowest priced contaminants at $1717.00/short ton
4. Zinc-of which there is a lot on site price is $3080.00/short ton
5. Lead- no good estimates for quantity on site but there is a lot, and the price is $2454.00/short ton ore

chromium, nickel,copper, selenium, and cobalt are probably there at concentrations too low to consider separately but may be recoverable as an alloy and then fractionally crystallized or electrolytically separated.

Organics could be stripped out by steam distillation separated by fractional distillation and then either destroyed at high temperature or purified and sold as pure high added value compounds.

An easy low cost fuel for these processes is easily available by using Petcoke. The major contaminant in it is Vanadium. A recoverable value added article of commerce and the main reason it is not being used in the US as fuel.

Additional technologies could be gleaned from a compendium called Superfund Innovative Technology Evaluation (SITE)from the University of Michigan Library. An additional book called SITE Program Progress and Accomplishments, is also available from the U of Mich. Library.

The key to all this is to think in terms of a break-even operation, at least at first until the unavoidable technical problems are solved. At break-even, the PRP's would loose nothing, the shareholders would not complain , since they would loose no interests or dividends.

Planning is critical, especially in sizing a small slow operation. Ultimately the developed technology could be marketed globally with a potential for real profit. Meanwhile a headache liability would be disposed of, and the city of East Chicago will benefit from marketable light industrial sites.

By removing the contaminants you would unavoidably solve the Aquifer contamination problem making a portion of groundwater available as gray water for many uses. The waste water could be handled by existing water treatment facilities since they are sized for a larger industrial base that has shrunken. This last point, of increasing the fresh water availability for the region has global implication if you consider the ever increasing pressure for clean fresh water. By reducing the dependence on Lake Michigan you increase the value of the lake and all who are dependent on the lake.

Presented by [redacted] (b) (6)

Points for Jan 10 EPA Meeting on Status of DuPont Superfund Site in East Chicago

By inspecting the Data available from the report entitled Human Health Risk Assessment (published 2012) HHRA important facts can be inferred for the whole site.

1. By focusing on the condition of the various waters analyzed on site, it is clear that all the waters are contaminated with pollutants not found as natural deposits in any of the geological strata found at any depth in East Chicago.

2. Most of these pollutants were brought to this site as part of the manufacturing operations carried out by the businesses sited at what is now called the DuPont Site, dating back to the mid to late 1800's and continuing, in reduced form, till today (Jan. 2018)

3. The water analyses show that a large fraction of the soluble pollutants are toxic to all life other than some microorganisms, many are cumulative, biomagnify as they move up the trophic scale, and since they are basic elements, can not be treated in any way to make them nontoxic.

4. The devilish illusion that one can detoxify such materials by changing them in some way to make them insoluble serves only to confuse and confound the citizens of East Chicago.

N.B. While forming high Ksp derivatives, macromolecular clathrates, soluble chelates, and other immobilization techniques does reduce the free ions in water solution over a short time frame (time involved depends on the derivative of the pollutant) the thermodynamically driven diffusion, from whatever source, will continue to leak poisons into the environment until an equilibrium is reached. For those pollutants which bioaccumulate and/or biomagnify, this simply means that toxic effects in the biota(including most importantly people) will simply be delayed not eliminated.

5. Waters which are so contaminated include: Redevelopment Area Surface Water (Table A-5) Open Area Surface Water (Table A-9), Buffer Area Surface Water (Table A-13), Redevelopment Area Groundwater (Table A- 14) [1], Redevelopment Area Groundwater (Table A-14)[2], Riley Park Area Groundwater (Table A-15)[1 & 2] These are all the water analysis tables in the HHRA report. Copies of these Tables are appended to this commentary. Sic vide

6. Since **ALL** the waters show contamination to varying degrees, it is clear that the sources are not just the migration of groundwater from a common place to the extent of the site ,but **must be dissolving these materials in each section of site.** Hence a surface or subterranean source exists every where on the DuPont Site. Q.E.D. These multiple sources both surfacial and buried must be removed before any other use can be made of this land. The hocus pocus currently being attempted by several authorities to settle this site is, dishonest, misleading, dangerous to health and property, and official misconduct.

7. The majority of the detectable toxics are inorganic, a few are organic which I will comment on.

a. Antimony is such a horrendous poison that virtually any level poses a threat to humans and other living things. I am addressing professionals, I need not elaborate.

b. the EPA and others have focused on arsenic. Most people realize the danger that that represents, however, you have failed to emphasize the cumulative aspect of this poison. In the past it was a poison of choice because the administration of very low levels eventually can lead to death, and the symptoms mimic other organic diseases. You are focusing on the legal limits, ignoring that individual sensitivities can throw your legal limits into a chamberpot. Furthermore, the synergistic effects of multiple pollutants weakens a living organism and can significantly lower the tolerance level below a legal limit. This is true for many other pollutants in this witches brew, not only arsenic.

c. Cadmium, shows up in all of the water samples. Its effect on heart health is well documented in much medical literature and yet you choose to ignore its presence and again ignore the fraction of the East Chicago population which might be highly sensitive to this toxin. Who are these people? How many are there out of 27,000?, ten ? a hundred? a thousand? You don't know and your attitude indicates you don't care.

d. Cobalt is a known micronutrient, however the amount necessary for the health of all animals(cobalamin is synthesized by gut bacteria) is very , very small. Chronic exposure to higher levels can lead to a variety of diseases. N x 10^{-3} is not a very low level for Cobalt.

e. Chromium is found in relatively low levels in most of the waters, however no information is given as to its valance. Is it III or VI it makes a difference

f. Copper, this this element seems to b e well below toxic limits for all analysis with respect to human toxicity (HHRA) but its effect on invertebrates and algae at these levels needs to be evaluated .

g. Fluoride, free Fluoride ions are toxic to most life forms at varying levels. The use in drinking water is presently in question. The spot values at 4.9-2.4 mg/L are high and while lower elsewhere are seriously questionable since free Fluoride is intensely reactive with metals with which it forms insoluble precipitates, or soluble complexes. Why is it in these waters? In what form?

h. Iron III forms very insoluble compounds with most counter ions. These are then in equilibrium with the free iron in water.. All the water samples contain iron at about 1-2 mg/L (1-2 ppm) this is not a dangerous level but the synergistic effects when combined with other pollutants has not been studied in these areas and positive data is needed to allow a rational decision.

i. Lead, since lead is a well known and documented cumulative neurotoxin, to talk of allowable levels, where the health of children is involved is criminal. Individual susceptibilities can not be predicted accurately, therefore, the precautionary principle dictates that a zero level limit must be attempted. The mealymouthed arguments against this are driven not by intelligence but by an unwillingness to bear the costs of such a program. In other words, greed and elitism.

j. Manganese toxicity is well known,the multiple complex symptoms, some of which resemble Parkinsonism, come under the title of manganism. IOM upper limit is 11mg/day. Individual sensitivities are not considered by this nor are possible synergistic effects . Data for non mammal or invertebrate animals is not considered and therefore ecological considerations are ignored (not unreasonable for an HHRA) but as the **ENVIRONMENTAL PROTECTION AGENCY** you must consider these factors since we humans are massively dependent on the natural world around us even though some idiots are in denial.

k. Nickel is a suspected (strongly) carcinogen and well documented allergen. It potentiates an hypoxic response. OSHA considers an air density of 10mg/m^3 immediately hazardous to life and health. All of the water samples contain some low levels of nickel, **WHY**? THERE ARE NO KNOWN NATURAL DEPOSITS OF NICKEL WITHIN 100 MILES OF EAST CHICAGO!

l. the hysteria over Nitrites in food sources has been done to death. Both Nitrate and Nitrite levels are low in the waters but the niggling problem of source remains. In natural areas pulses of nitrite can be expected but in highly impacted polluted areas , such this DuPont site, only a non natural source remains, What Is It?

m. Selenium is a rare element on earth. For it to be found on site at DuPont implies a non natural source. Selenium is a micronutrient but by the same token systemic toxic effects can occur at ~ 800 ug/day and the dietary limit is set at 400 ug/ day. Levels here are again below these limits but Why is this stuff here ? And why is it found in all the water samples?

n. Titanium is not known to be toxic to humans at any level however it can bioaccumulate in the presence of silica and appears to be a micronutrient for many plants. As usual, is this another gorilla in the closet? Our massively stupid current leadership will not countenance the expenditure of money for research which does not yield an immediate profit. Titanium only was found in very few samples from the DuPont site but it is not a natural constituent of the geology of the region.

o. Vanadium is now found in this region primarily because of the processing of tar sands by B P where itg concentrates in PETCOKE . However, Vanadium salts were used as catylists by DuPont and it occurs in all the water samples tested. There are no natural vanadium sources near East Chicago. All vanadium compounds are considered toxic.

Points for Jan 10 EPA Meeting on Status of DuPont Site in East Chicago

January 9, 2018

By inspecting the Data available from the report entitled Human Health Risk Assessment (published 2012) HHRA important facts can be inferred for the whole site.
1. By focusing on the condition of the various waters analyzed on site, it is clear that all the waters are contaminated with pollutants not found as natural deposits in any of the geological strata found at any depth in East Chicago. Why are EPA and IDEM ignoring this fact?

2. Most of these pollutants were brought to this site as part of the manufacturing operations carried out by the businesses sited at what is now called the DuPont Site, dating back to the mid to late 1800's and continuing, in reduced form, till today (Jan. 2018) The toxic exposure of the residents of not only East Chicago but the entire North West Indiana has been taking place since before the formation of the EPA, why does this not trigger an enhanced response?

3. The water analyses show that a large fraction of the soluble pollutants are toxic to all life other than some microorganisms, many are cumulative, biomagnify as they move up the trophic scale, and since they are basic elements, can not be treated in any way to make them nontoxic.

4. The devilish illusion that one can detoxify such materials by changing them in some way to make them insoluble serves only to confuse and confound the citizens of East Chicago.
N.B. While forming high Ksp derivatives, macromolecular clathrates, soluble chelates, and other immobilization techniques does reduce the free ions in water solution over a short time frame (time involved depends on the derivative of the pollutant) the thermodynamically driven diffusion, from whatever source, will continue to leak poisons into the environment until an equilibrium is reached. For those pollutants which bioaccumulate and/or biomagnify, this simply means that toxic effects in the biota(including most importantly people) will simply be delayed not eliminated. Why does the EPA ignor or sidestep this reality?

5.Waters which are so contaminated include: Redevelopment Area Surface Water (Table A-5) Open Area Surface Water (Table A-9), Buffer Area Surface Water (Table A-13), Redevelopment Area Groundwater (Table A- 14) [1], Redevelopment Area Groundwater (Table A-14)[2], Riley Park Area Groundwater (Table A-15)[1 & 2] These are all the water analysis tables in the HHRA report. Copies of these Tables are appended to this commentary. Sic, vide

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p. Zinc. The micronutrient status of zinc is well known and understood. While humans seem quite tolerant of zinc levels less than 100 ppm, many plants, and invertebrates are sensitive to micromolar quantities and one study showed the serious vulnerability of the water flea Daphnia magna to low levels of zinc (93% death rate). The levels of zinc in the above waters are not dangerous to humans, the effect on the environment especially the sections called the natural area could be sever.

q. 1,1 Dichloroethane does not occur naturally in the environment. ASTDR has a toxics advisory for this material since it is a nervous system toxin in humans .

r. 1,2 Dichloroethane also occurs in DuPont soils it is very toxic and a suspected carcinogen. It azeotropes with water and other solvents and is very persistent in anoxic aquifers. Where is it from? Why is it here?

s. Bis(2-ethylhexyl) Phthalate- this is a plasticiser similar to those used in plastic water bottles . The acute animal toxicity is very low but it is an endocrine disruptor, cardiotoxic, obesogenic, and developmental retarder (testis). Since it is very insoluble in water, why is it showing up in the Riley Park waters?

Earlier reports, some generated by DuPont itself in 1967 and 1998, just to list two of the many available, showed shockingly high levels of pollution and more diverse lists of pollutants. How is it that the levels in the HHRA are between 10 and 100 times lower than in reports generated in 1998 ? These reports are available to us and most certainly had to be available to EPA and IDEM **for at least 19 years !**

Prepared by [redacted] (b) (6)

Questions for the Jan 20 EPA Meeting in East Chicago

1. Considering the verified existence of the Calumet Aquifer, and its obvious impact on your "clean-up "in zones 2 and 3; why do you not acknowledge this and inform the residents that may expect only a temporary remission in pollution exposure of perhaps 1-5 years.

2.Why are ignoring the medical fact that a significant fraction of resident population (estimated at 16.5 %, assuming a normal distribution and considering only the negative leg of the remainder after 2 sigma have been subtracted) will be susceptible to serious effects of the pollution, including cancer , diabetes, and other debilitating diseases? If we assume a population of ~27,000 this calculates to 4,455 persons who would still be susceptible to potentially serious or deadly effects at the allowable limitt of pollution. What is your justification for this an where may we find your data?

3. In keeping with the above hypersensitivity proposal, please explain the rational behind your toxicological normalization factors which are supposed to compensate for synergistic effects of multiple pollutants. My fear is that these factors are based on measures of centrality that do not take into account the probable skewing effects on the results due to the log normal influence of higher pollutant concentrations where the influence of each pollutant requires a different factor based on individual susceptibilities not assessable a priori. This would only be obvious in an "n" dimensional analysis of which I have seen no evidence in any of your repors.

4.It is well known and adequately documented that all hazardous waste containment facilities leak after a period of time usually from 3-5 years. Yet not even such a temporary properly prepared facility has been erected, and approved, by any authority, anywhere at the USS Lead site. How will you prevent recontamination of private properties adjacent to the uncontained hazardous waste buried at the site considering the known long term effect of the Calumet Aquifer and precipitation? What written guarantees will you give the citizens of East Chicago?

5. I question your protocol for determining the need for soil removal and replacement on individual properties. Averaging the results of the samples, and using that average to determine the critical level would only be valid if the contamination is purely airborne from adjacent soil sources. This is clearly not the case for many households in East Chicago. To list but a few potential additional sources: sump pumps in the basement, tracking contaminants onto the property by pets, visitors and wild things, flooding of the property from contaminated water sources, and many more.

Prepared by: [redacted] (b) (6) (b) (6)

FOIA EPA-R5-2022-005742

USACE is pumping from the bottom of the Calumet Aquifer and doing nothing to extract and destroy, recover, or treat contaminated soil, the "Free Phase Hydrocarbon" layer of contamination floating on top of the groundwater, or the contaminated groundwater itself...

Pumping from the bottom of the aquifer combined with infiltration of water downward through the CDF could very well be creating a mixing action upon the Calumet Aquifer's contaminated contents.

The USACE's pumping from the bottom of the bottom of the Calumet Aquifer while dewatering 100,000 to 200,000 cubic yards of dredged wastes through the CDF each year as planed is an uncontrolled experiment which is already yielding complications to the Containment Strategy by clogging groundwater extraction wells' capacity and causing pump failures.

Since 2012 Extraction wells have experienced pump failure due to clogging and reductions in well capacity over time in 3 areas of the Indiana Harbor CDF. The extraction wells are a key component of the USACE's Containment Strategy for the toxic and/or hazardous industrial chemical wastes under the CDF and the dredged materials hydraulically pumped into place there.

"Comparisons of the specific-capacity values calculated from well development data collected following extraction well installation to those calculated during the single well aquifer tests at EW–4B, EW–14A and EW–11C indicate that the productivity of extraction wells on the CDF property has diminished since 2008." – U.S. Geological Survey

Figure 4. Precipitate of unknown origin adhered to the intake manifold of a pump installed in extraction well EW–4B, East Chicago, Indiana, May 8, 2014.

"Beginning in 2012, some extraction wells on the CDF site began to experience fouling—a precipitate of unknown origin formed on the intake of the extraction well pump and caused the pump to overheat and become inoperable, which required site personnel to pull the equipment from affected wells and replace their pumps (fig. 4; Ben O'Neil, U.S. Army Corps of Engineers, oral communication, 2015). Of the affected extraction wells, some experience fouling more frequently than others." – U.S. Geological Survey

"Comparisons of the specific-capacity values calculated from well development data collected following extraction well installation to those calculated during the single well aquifer tests indicate that the productivity of the extraction wells on the CDF property have diminished since 2008. The decrease in the calculated hydraulic conductivity from air slug tests performed during August–September 2014 to March–May 2015 for MW–11A and MW–14A indicate the development of an altered, low conductivity wellbore skin that is affecting the connection of the well screen to the surrounding aquifer material." – U.S. Geological Survey

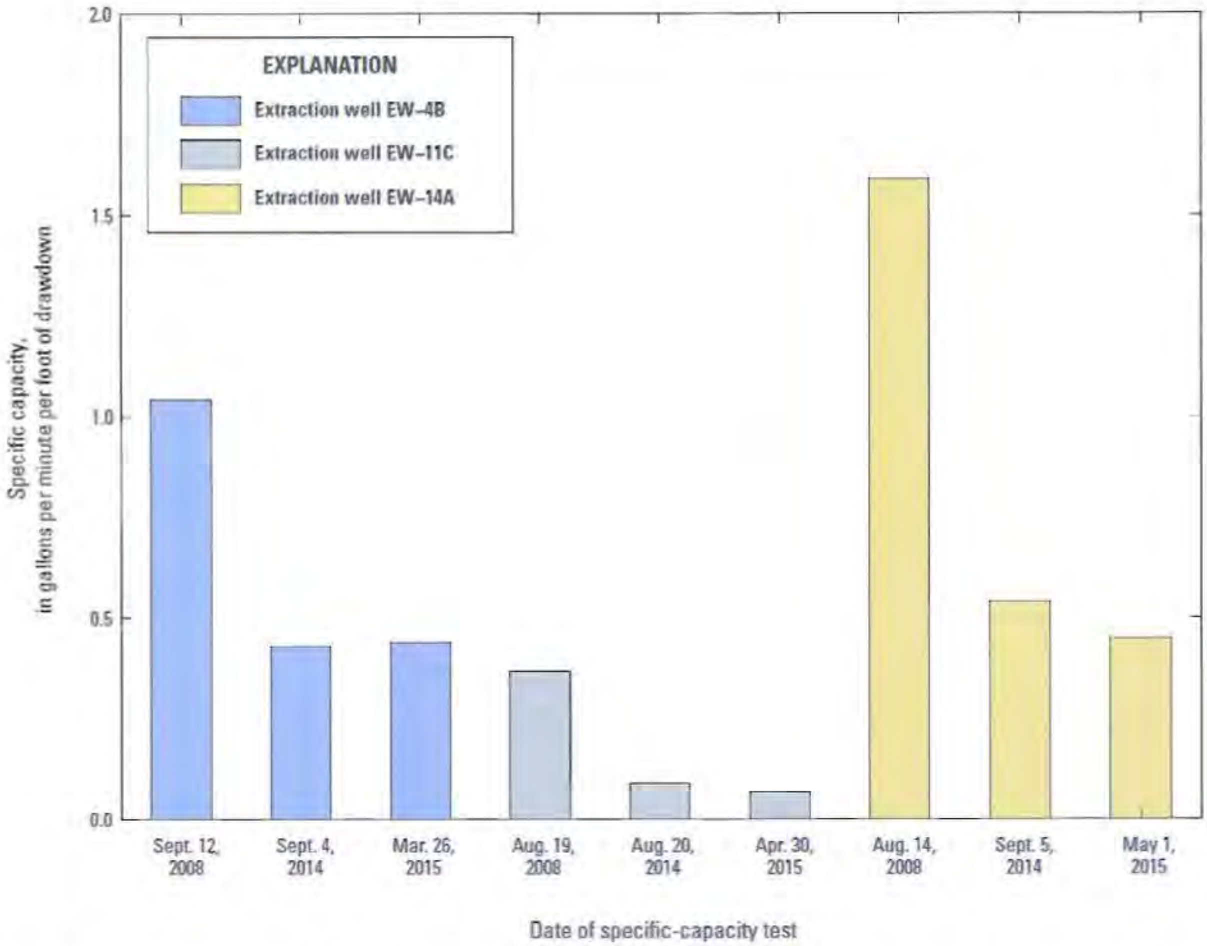

Figure 15. The decrease in specific capacity for extraction wells EW–4B, EW–11C, and EW–14A from 2008 to 2015.

"At this point, because of the dredging operation, there's a large influx of water into the CDF. And what the pump right now is actually constantly running to try to catch up with that influx of water. And so right now, we're slowly – we're regaining the inward gradient." – USACE

"It is intended that the groundwater protection system would operate in perpetuity to maintain an inward hydraulic gradient on site, and to contain existing historical contamination on site." – USACE

"Repeated step drawdown and recovery testing of the extraction wells tested during this study provided results that indicate a slight increase in the development of a skin and a decrease in the connectivity of the extraction wells with the Calumet aquifer." – U.S. Geological Survey

For example: "[A] groundwater pump and treatment system based on EPA's current understanding of flow may be grossly inadequate to prevent the continued offsite contamination of groundwater. If potent NAPL [non-aqueous phase liquid] pools are present they may be drawn into the extraction wells and overwhelm the treatment system designed for much lower contaminant levels. Another possibility is that lowering the groundwater under the landfill (resulting from groundwater extraction) may actually dislodge NAPLs and thus aggravate groundwater contamination problems" – U.S. Congress, Office of Technology Assessment

"For large contaminated aquifers, pumping and treating contaminated groundwater is less effective than previously believed. For large landfills, capping is an impermanent solution." – U.S. Congress, Office of Technology Assessment

USACE's application for this permit offers no information on the risk or risk reduction provide by the groundwater extraction & gradient system or any specific risk information or risk reduction objectives for any groundwater cleanup or ongoing off-site migration of contaminates. Nor does it say anything about the limits to or uncertainty of pumping from the bottom of the Calumet Aquifer in "perpetuity."

"Pumping from the Calumet aquifer to dewater specific sites is common in the study area." – U.S. Geological Survey

"Pumping lowers ground-water levels and creates a depression in the water table surrounding the pumpage. Ground-water gradients along most of the GCR/IHC usually are toward the river and canal (Fenelon and Watson, 1993, p. 25). If a depression in the water table because of pumpage extends outward from the pumping location to the GCR/IHC, a flow reversal can result and surface water can flow from the canal/river into the aquifer towards the pumping center." – U.S. Geological Survey

"Another small depression in the water table is shown to the north of the Lake George Branch (fig. 15). This depression explicitly is indicated on water-table maps for April 1989 (Fenelon and Watson, 1993), November 1990 (Greeman, 1995), and June 1992 (Kay and others, 1996), and is shown as an area of lowered water levels on water-table maps for other periods. This water-table depression was caused by pumping by an oil refinery as part of a remediation effort (Fenelon and Watson, 1993, p. 19)." – U.S. Geological Survey

"The Operational Treatment Plant will treat three influent flow sources (combined into one stream for treatment): sediment pore water, ECI site groundwater, and precipitation runoff. Groundwater is discharged into the East cell; the West cell receives only sediment pore water and precipitation. Water is also pumped between the two cells to balance the water levels in the CDF, so that all waters should be considered thoroughly mixed. As part of the ponded CDF operation, water will be held in the CDF for some time before and after dredging. The water quality of the ponds changes over time as it is held. Suspended solids settle out, ammonia degrades through the presence of naturally occurring bacteria, and organic compounds settle with the solids or are volatilized or biologically degraded." – USACE

"The estimated volume of water in the pond needing treatment is also expected to decrease from an annual 55 Mgal to an estimated 30 Mgal over the anticipated 4 to 5 month treatment season, due largely to increased evaporation from the pond." – USACE

MONITORING FOR LEAKS & EMISSIONS

Air monitoring stations should be deployed based upon historic Wind Rose data from month to month and real time monitoring should be based upon current metrological conditions at the time of monitoring.

Continuous state of the art monitoring utilizing Infrared, LIDAR, and Gas Chromatography devices should be deployed for air monitoring of as many known contaminates and their sources as possible…

"…LIDAR has shown that the concentration of the particulate matter content of clear air is highly variable and that such variations can indicate the structure and motion of the clear atmosphere. These capabilities have applications in atmospheric and meteorological research and various operational activities." – R. T. H. Collis

"A hydrocarbon layer has been intermittently encountered during groundwater monitoring activities since the beginning of the site investigations in 1991."

"There is no systemwide, continual monitoring program for Great Lakes CDFs. However, CDF water quality monitoring generally occurs during dredging and disposal operations and 12 CDFs do have monitoring wells in dike walls. The effectiveness of these monitoring wells has been questioned and may have limited value." – Steve Thorp, Great Lakes Commission

A Phase III Subsurface Characterization Report performed by Environmental Resources Management (ERM) revealed detectable concentrations of PCBs, pesticides, and volatiles in the site soils, groundwater and in the hydrocarbon layer."

"Two wells showed PCB concentrations greater than 50 ppm in the free-phase hydrocarbon layer." "These two locations are on the southern side of the site, within a few hundred feet of the canal, and approximately midway between the east and west boundaries." – Appendix I Design Documentation Report, USACE, 1999.

Reliance on Containment is Uncertain & Risky:

- Technologies selected as physical barriers (slurry wall and cap) are known to fail by U.S. EPA as stated by them in the Federal Register… And USACE has detailed construction deficiencies in the Containment Structures due to "deep obstructions" underground;

- Active containment via groundwater drawdown already experiencing pump failures and well capacity reductions due to CDF site conditions / lack of remedial and corrective actions before CDF construction;

- Emergency Action required due to entirely predictable "bathtub effect" after containment barriers installed caused failure of Sheet Steel Piling Wall along the Lake George Branch of the IHC was unforeseen by USACE;

- Containment located arbitrarily due to existing infrastructure and fails to encompass and contain known contaminated soils, plumes of groundwater contamination, and the "Free-Phase Hydrocarbon Layer" floating on top of groundwater up to 10 feet thick and migrating into the West (Lake George) Branch of the IHC

CONCLUSIONS

Don't Worry it's Under Control' – The USACE Two-Step: Or how the United States Army Corps of Engineers wants to make a Toxic Substance Control Act chemical dump out of a Confined Disposal Facility (CDF) that's within one-half mile of a high school, an elementary school, a city golf course, and a residential area in East Chicago, Indiana…

The goal should be unrestricted use for the CDF site not a 160 acre sacrifice zone in the middle of East Chicago, Indiana and the Marquette Plan area that is off-limits forever…

"Studies have been undertaken for all Canadian CDFs and the results indicate that plant and animal life that inhabit CDFs are bioaccumulating contaminants. Canadian researchers have suggested that waterfowl that inhabit or visit CDFs may be good biomonitors of bioaccumulation of sediment-associated contaminants." – Steve Thorp, Great Lakes Commission

"Plants grow quickly on dredged material inside CDFs and have provided an attractive habitat for some wildlife. Monitoring studies have shown that plants and animals that inhabit the CDFs may uptake contaminants from the dredged material. The degree of uptake varies with the organism, contaminant, and site conditions." – USACE

U.S. EPA and IDEM must require the USACE to dredge the IHC in its entirety to a clean bottom and to adequately treat any wastes generated from dredging to a level that eliminates risks to human health and the environment through the use of combinations of available innovative technologies. The USACE has a 42 year history of demonstrating that without being required to do so by U.S. EPA's and IDEM's such innovative treatment never will occur and permanent solutions will never take place.

U.S. EPA produced **Indian**a Harbor Site Proposed Sediment Clean-up Goals and granting this permit approval without requiring the USACE to dredge the IHC in its entirety to a clean bottom and to adequately treat any wastes generated from dredging to a level that eliminates risks to human health and the environment through the use of combinations of available innovative technologies that reduce the toxicity, mobility, or volume of toxic and/or hazardous dredged wastes will fail these cleanup goals.

USACE is the responsible party for deep contaminated sediments (up to 45% by volume in some locations) because of their dredging the IHC deeper by nearly twenty feet in some locations during World War II. The USACE's refusal to clean up the mess they precipitated by creating such a deep sediment trap in the first place is willful negligence in preventing full restoration of IHC and protecting the public and our environment. It also is a waste of taxpayers' dollars not to dredge the entire depth of the IHC of all contaminated sediments given the long-term risks, costs, and uncertainty…

Does it make any sense designate the entire expanded CDF capacity of 4,800,000 cubic yards of "heavily contaminated sediments" into a Toxic Substance Control Act toxic chemical land disposal facility when 200 thousand cubic yards capacity are requested by USACE?

Only if the next step is to also accept Hazardous Waste after Toxic Substance Control Act (TSCA) chemical waste landfill permitting – coincidentally there's that nagging issue of what to do with the "Presumptively Hazardous" sediments that need to be dredged from Indiana Harbor. Hmm…

We will witness the creation of a 160 acre toxic chemical dump next to two schools, a city park, and residences. What can you learn from that? Maybe that when you have government approving government the answer is bound to be yes! And likely another environmental liability to our communities long into the future.

The USACE is use to getting its way – it's the Army after all… I always thought that the United States Army was suppose to protect America not force another toxic disposal site with requirements for maintenance in "perpetuity" upon Northwest Indiana and the children of East Chicago, Indiana.

Emergency notifications need to include to local authorities, schools, residents, local businesses & workers not just U.S. EPA, IDEM and ECWMD…

Twelve years ago people questioned whether the East Chicago Waterway Management District had "either the expertise or the money to oversee the project properly, especially since the agencies' environmental impact statement didn't address "the fundamental question of who has responsibility for unfunded liabilities and third party claims" if anything should go terribly wrong." The USACE has provided conflicting answers and the question remains… So which is it?

This: "USACE has an existing project partnership agreement with the owner (the East Chicago Waterway Management District), and under this agreement USACE operates the site. The site operator is the USACE and USACE is the responsible party for the operation and maintenance of the site. Most operation and maintenance activities will be completed by independent parties under contract to USACE." – USACE

Or this: ""In 1989, the city of East Chicago became the owner of the ECI site as payment for back taxes owed by ECI. In assuming ownership without approved corrective and closure actions in place, the City of East Chicago also assumed the liability for the site. In 1994, the property was transferred to the East Chicago Waterway Management District (ECWMD), which serves as the local cost-share sponsor with USACE. In May 2005, the funding stream for CDF construction was converted to 100% federal, however ECWMD still maintains liability for cleanup of hazardous releases, including any TSCA sediment releases, under the existing Project Cooperation Agreement between USACE and ECWMD." – USACE

Twelve years ago Harold Henderson quoted local activist Betty Balanoff in his reporting on topic and she said: "To date there have been no real changes from the corps' original plan" "Only great community pressure persuaded them to research the project more thoroughly. Requests for any improvements are met with the excuse there is not enough money. There is no money to insure the project, to indemnify the community for property losses or for additional health problems, even though medical insurance here is at a minimum. We understand that the law mandates a cleanup of the ECI site and the dredging of the canal. But if there is not enough money to do it safely, more money must be found. The community cannot be expected to pay the difference in human life and damaged children."

Northwest Indiana and East Chicago, Indiana in particular have suffered more than their fair share of the burden of pollution and contamination of their communities.

The U.S. EPA and IDEM cannot continue to ignore the blatant environmental injustice of creating one of the largest toxic chemical land disposal units on the Great Lakes and the additional risks it will create…

"The cancer risk due to inhalation exposure to CDF emissions is estimated to be 2.3 x 10-6 (2.3 in 1,000,000). Based on air monitoring data, the total estimated cancer risk due to air toxics inhalation exposure from other sources in the area (i.e., without including CDF emissions) for 30 years is estimated to be 3.1 x 10-4 (3.1 in 10,000 or 310 in 1,000,000)."

"The corps and EPA conclude that a little more pollution can't hurt when things are already this bad. But a resident, or any reasonable person, might well conclude something very different--that simple fairness demands a "no net increase of pollution" rule for East Chicago--if a new CDF or industry will add to the existing pollution, then the EPA should at least bring about a matching decrease someplace in the area." – Harold Henderson

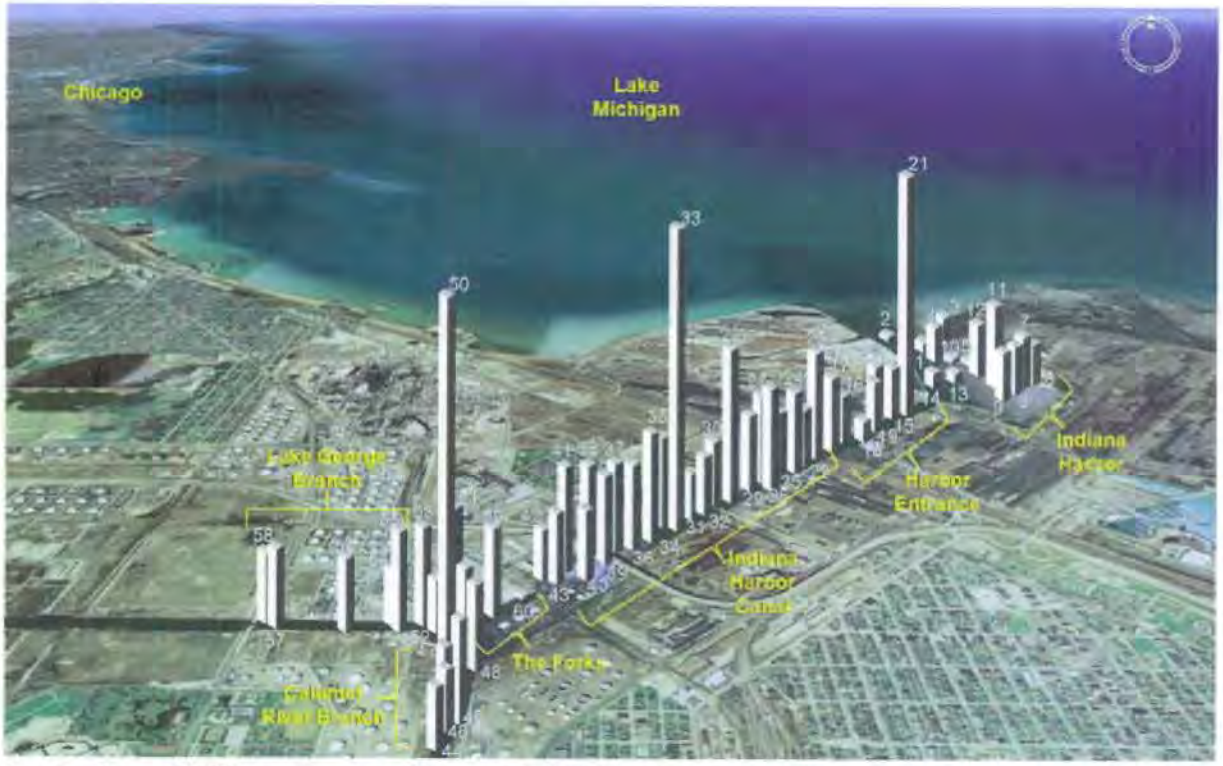

Illustration of IHC surface sediments PCB levels – contamination increases with depth.

Cleanup of RCRA Hazardous and TSCA Toxic chemical wastes must require preference to permanent solutions involving innovative treatment to eliminate their hazards & risks to human health and the environment and none are currently offered by USACE.

Indiana Harbor CDF was built on top of an active Superfund & Hazardous waste site;
Yes sir, the USACE is all about saving taxpayers' money…
But USACE Money is never enough to do the job right…
Not enough money to complete the RCRA Corrective Action at ECI;
Not enough money for removal of underground pipelines at ECI;
Not enough money for a liner or leachate collection system for the CDF;
Not enough money to hydraulic dredge IHC to clean depths;
Not enough money to separate and treat dredged wastes prior to disposal;
A shoestring CDF to TSCA toxic chemical dump sham forced upon Northwest Indiana…
But there's plenty of USACE money to grab & plop, slop & wash, slurry & pump, and hydraulically open dump toxic and hazardous dredged wastes in an unlined CDF within 1/2 mile of two schools, a city golf course, and residences for 30 years…

See Video at 2 minute, 30 second mark: [https://vimeo.com/70892379] 'Dredging Indiana Harbor'

"The Water Resources and Development Act of 2007 (WRDA 2007), Section 2005 amends Section 217 of WRDA 1996 regarding dredged material management. Important facets of this bill relating to CDF sustainability and beneficial use are as follows (USACE 2008b):

- Broadened definition of dredged material management measures--extends Federal participation in dredged material management facilities beyond disposal facilities and can include processing, treatment, and contaminant reduction.

- Non-Federal interests can perform acquisition, design, construct, manage, or operate a cost-shared dredged material processing, treatment, contaminant reduction, or disposal facility.

- Dredged material processing, treatment, contamination reduction, or disposal facilities may manage dredged material from multiple Federal projects in the region with combined cost-sharing among the multiple projects.

- The Corps of Engineers can pay the Federal share of dredged material disposal or placement capacity for Federal projects at dredged material processing, treatment, contaminant reduction, or disposal facilities.

- A non-Federal cost-sharing sponsor may receive credit for funds provided for dredged material processing, treatment, contaminant reduction, or disposal facilities.

- The Act does not change the Federal Standard to dredge in the most cost-effective way consistent with economic, engineering, and environmental criteria.

- If a dredged material processing, treatment, contaminant reduction, or disposal facility is not the Federal Standard, but beneficially uses dredged material for structural or nonstructural flood control, hurricane and storm damage reduction, or environmental protection and restoration, it can be considered for Federal participation under the beneficial use authorities of Section 204 of the WRDA 92, as amended by Section 207 of WRDA 97 and Section 2037 of WRDA 2007."

This raises the concern of other USACE projects or outside entities using the Indiana Harbor CDF and the continued lack of permanent solutions and innovative treatment technologies for reduction of the toxicity, mobility, or volume of dredged wastes…

The USACE Plan Is ultimately the most expensive possible relying the cheapest Short-Term cost option without adequate consideration of Long-Term Hazards and Costs…

The USACE has taken coercive public positions in seeking this Permit Approval by threatening not to Dredge the IHC if the Permit is not Approved and issued all the while emphasizing how much "heavily contaminated sediments" continue to disperse into Lake Michigan and hamper navigation on the IHC.

The permit approval would enable USACE to continue with open dumping land disposal of toxic and/or hazardous wastes utilizing methods and facilities that:

Lack a Permanent Remedy;

Do not reduce toxic dredged waste Volume;

Do not reduce dredged waste Toxicity;

Doe not reduce dredged waste Mobility;

Do not eliminate dredged waste Hazards & Risks;

Do not eliminate Human Exposures or Environmental Releases; and

Only has 65 years Monitoring but perpetual Maintenance & Costs…

There is an obvious and recognized need for the scale up and use of known & new innovative cleanup technologies for dredged wastes to achieve permanent solutions – where better fulfill such needs on an industrial scale than East Chicago, Indiana where industrial scale technologies have been developed for over a century and created these toxic and chemical wastes in the first place?

"The Environmental Protection Agency's (EPA's) risk analysis for potential air emissions from the proposed CDF says the facility could pose an increased lifetime cancer risk to an individual at the high school of two in a million. The analysis concludes that this additional risk is statistically irrelevant because the overall cancer risk from breathing the air in East Chicago is three in 10,000. That rationale leads to the following conclusion: The CDF could not be put in a wealthy residential community far from industry and heavy traffic because such a community would have a much lower background risk of cancer. The CDF would measurably increase the risk in that community. So the EPA is telling us the CDF would only be acceptable in a community that is already at high risk for cancer. The residents of such communities are typically lower income and often minorities, as is the case in East Chicago. Thus, the rationale behind the siting of this CDF is inherently unjust." – Bowden Quinn and Jennifer Gadzala, Grand Cal Task Force

"Government should have a policy of net risk reduction for any hazardous waste site it proposes to put in an at-risk community like East Chicago. Rather than tell the community the additional risk is negligible, it should prove to the community that it has reduced its overall risk through other actions to limit pollution." – Bowden Quinn and Jennifer Gadzala, Grand Cal Task Force

"The principle of environmental justice is that no community should have to accept an unfair burden of pollution. Yet that is exactly what is being asked of this community. The government wants the people who live around the proposed site or who go to school at East Chicago Central High School to accept a CDF that poses a small but perceptible increased risk of cancer and a potential threat to the value of their homes. All of us will be able to enjoy a cleaner Lake Michigan as a result. We believe the people who are being asked to accept the sediments deserve more in return for that sacrifice." – Bowden Quinn and Jennifer Gadzala, Grand Cal Task Force

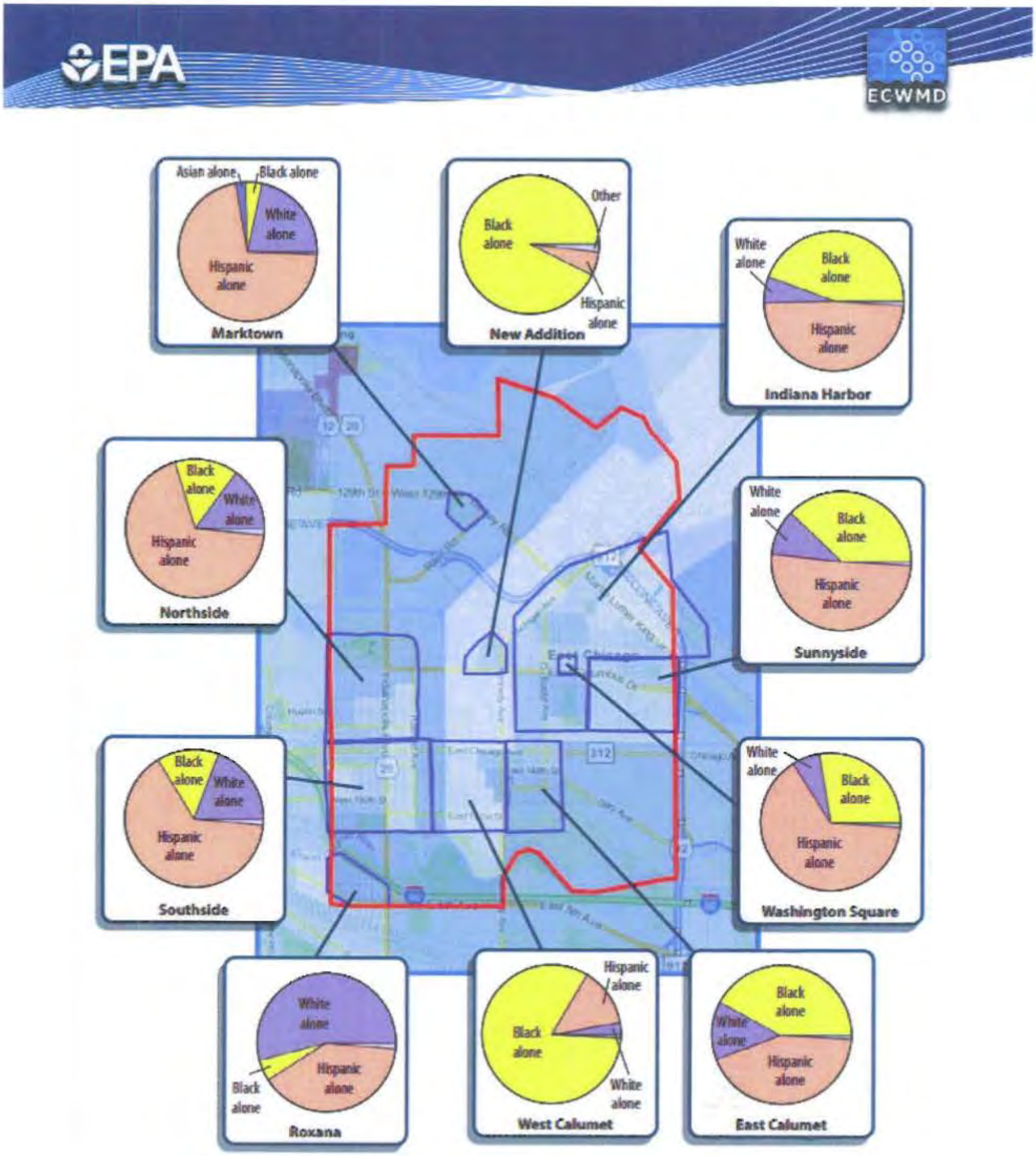

Figure 1 East Chicago Neighborhoods and Profile (source: city-data.com)

Demographics of Area surrounding the Indiana Harbor CDF…

The TSCA permit approval must be denied or modified to require a permanent solution using combinations of available innovative treatment technologies to reduce the toxicity, mobility, or volume of toxic chemical and/or hazardous dredging wastes and protect human health and our environment.

QUESTIONS

The PCB levels found in the IHC are comparable to other PCB contaminated sites in the U.S. like the Hudson River Superfund site with similar levels of PCBs requiring designation as Superfund Site and requiring the removal of contaminants from sediment. – Why is the IHSC not a Superfund Site?

So where is USACE's technology development program in the case of the Indiana Harbor CDF dump and pump TSCA chemical waste landfill permit?

Where are the public reviews the USACE committed to doing concerning technical dredging and disposal literature at least every five years and where has USACE "used all reasonable efforts" to take advantage of any advances in technologies?

Did the USACE switch to a ponded CDF because of difficulty in maintaining the proper inward groundwater gradient during dredging and dewatering operations?

How did unexpected difficulties presented by the characteristics of the dredged wastes themselves such as unexpected amounts of debris alter the planed handling procedures of the dredged wastes?

What are the effects of extracting groundwater from the bottom of the Calumet Aquifer?

Why are oil saturated and contaminated soils, free-phase hydrocarbons, PCBs above 50 ppm, Phenols at 750,000 ppm, etc and contaminated groundwater not being addressed or remedied at the ECI Site & CDF?

How is it possible for the U,S, EPA or IDEM to approve a risk-based permitting decision on this CDF that has Infinite open ended CDF maintenance in perpetuity? Does anyone actually think that will be the case? Because due to conflicting statements it still is not clear that USACE or ECWMD will ultimately be responsible for future liabilities...

"During the treatability testing, it was estimated that the concentrations of the dominant volatile components would be very near zero" – USACE

Is this because all or most of the VOCs will evaporate from the CDF?

Did USACE provide the required 2 foot inward groundwater gradient prior to operation of the CDF in 2012?

Has the required 2 foot inward groundwater gradient been maintained at all times since 2012?

If the ECWMD has liability for future costs, maintenance, and emergency response why are they, as the owner of the site, not included in this permit approval?

How does not having the owner of the site (ECWMD) included in this permit approval comply with laws and regulations pertaining to "Transfer of property" for the CDF?

TSCA now requires U.S. EPA to consider vulnerable populations, such as pregnant women and children – specifically how has this risk-based permit approval decision complied with the new TSCA requirements?

USACE justification for use of mechanical dredging is lower water content but subsequent slurry and pump with hydraulic open dumping operations defeats such justification by mixing dredged sediments with water pumped from the CDF to create a slurry not unlike that which hydraulic dredges create with sediments that are only 10-20% solids and result in an increase of 300-400% over the in-place sediment volume" how has U.S. EPA evaluated the hazards & risks associated with this significant change from USACE's original Plan?

How have the USACE changes from un-ponded to ponded operation impacted influent characteristics and volume or water to be treated?

How can U.S. RPA and IDEM approve this permit without any consideration of adding to the Risks of already living in the most industrialized city in the United States?

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USACE is pumping from the bottom of the Calumet Aquifer and doing nothing to extract and destroy, recover, or treat contaminated soil, the "Free Phase Hydrocarbon" layer of contamination floating on top of the groundwater, or the contaminated groundwater itself...

Pumping from the bottom of the aquifer combined with infiltration of water downward through the CDF could very well be creating a mixing action upon the Calumet Aquifer's contaminated contents.

The USACE's pumping from the bottom of the bottom of the Calumet Aquifer while dewatering 100,000 to 200,000 cubic yards of dredged wastes through the CDF each year as planed is an uncontrolled experiment which is already yielding complications to the Containment Strategy by clogging groundwater extraction wells' capacity and causing pump failures.

Since 2012 Extraction wells have experienced pump failure due to clogging and reductions in well capacity over time in 3 areas of the Indiana Harbor CDF. The extraction wells are a key component of the USACE's Containment Strategy for the toxic and/or hazardous industrial chemical wastes under the CDF and the dredged materials hydraulically pumped into place there.

"Comparisons of the specific-capacity values calculated from well development data collected following extraction well installation to those calculated during the single well aquifer tests at EW–4B, EW–14A and EW–11C indicate that the productivity of extraction wells on the CDF property has diminished since 2008." – U.S. Geological Survey

Figure 4. Precipitate of unknown origin adhered to the intake manifold of a pump installed in extraction well EW–4B, East Chicago, Indiana, May 8, 2014.

“Beginning in 2012, some extraction wells on the CDF site began to experience fouling—a precipitate of unknown origin formed on the intake of the extraction well pump and caused the pump to overheat and become inoperable, which required site personnel to pull the equipment from affected wells and replace their pumps (fig. 4; Ben O'Neil, U.S. Army Corps of Engineers, oral communication, 2015). Of the affected extraction wells, some experience fouling more frequently than others.” – U.S. Geological Survey

“Comparisons of the specific-capacity values calculated from well development data collected following extraction well installation to those calculated during the single well aquifer tests indicate that the productivity of the extraction wells on the CDF property have diminished since 2008. The decrease in the calculated hydraulic conductivity from air slug tests performed during August–September 2014 to March–May 2015 for MW–11A and MW–14A indicate the development of an altered, low conductivity wellbore skin that is affecting the connection of the well screen to the surrounding aquifer material.” – U.S. Geological Survey

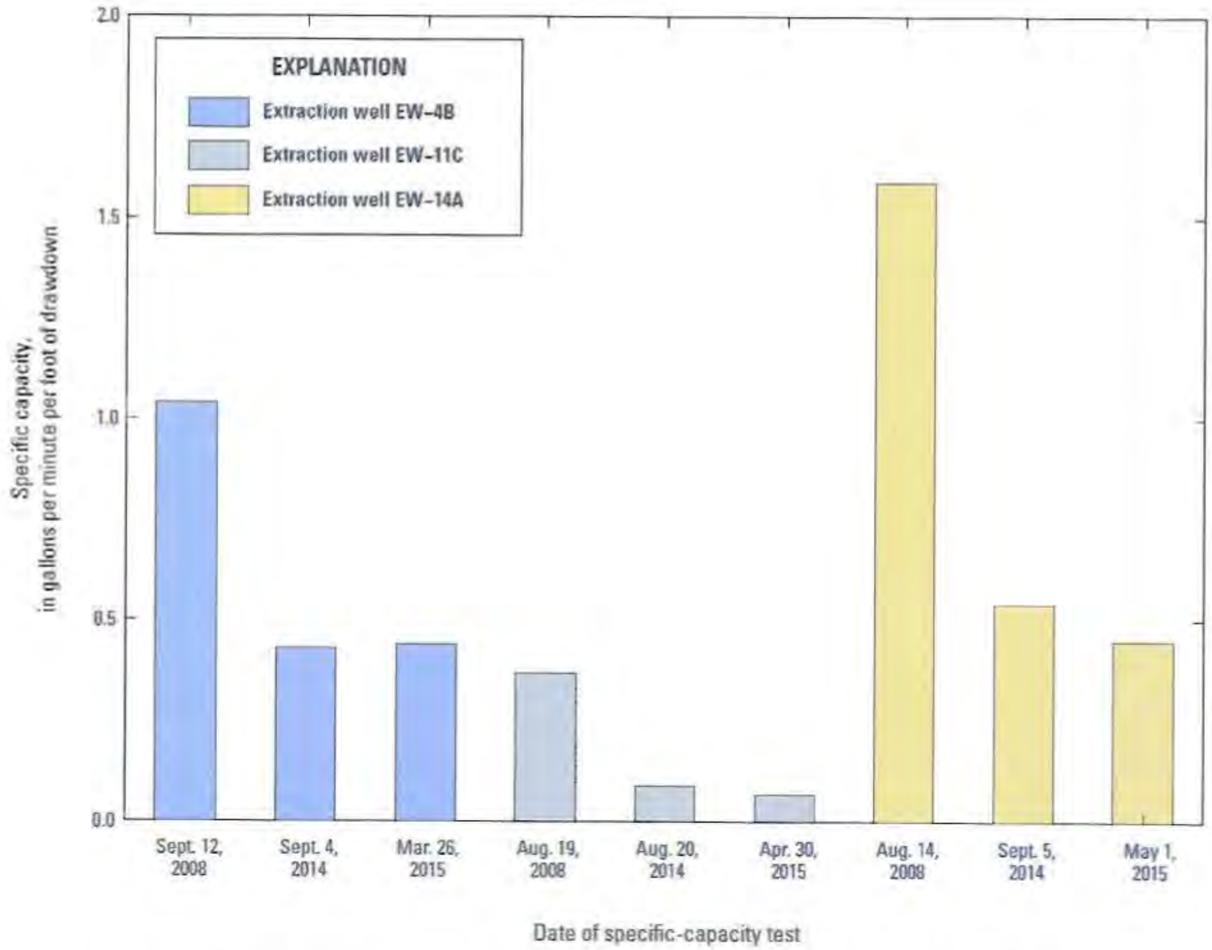

Figure 15. The decrease in specific capacity for extraction wells EW–4B, EW–11C, and EW–14A from 2008 to 2015.

"At this point, because of the dredging operation, there's a large influx of water into the CDF. And what the pump right now is actually constantly running to try to catch up with that influx of water. And so right now, we're slowly – we're regaining the inward gradient." – USACE

"It is intended that the groundwater protection system would operate in perpetuity to maintain an inward hydraulic gradient on site, and to contain existing historical contamination on site." – USACE

"Repeated step drawdown and recovery testing of the extraction wells tested during this study provided results that indicate a slight increase in the development of a skin and a decrease in the connectivity of the extraction wells with the Calumet aquifer." – U.S. Geological Survey

For example: "[A] groundwater pump and treatment system based on EPA's current understanding of flow may be grossly inadequate to prevent the continued offsite contamination of groundwater. If potent NAPL [non-aqueous phase liquid] pools are present they may be drawn into the extraction wells and overwhelm the treatment system designed for much lower contaminant levels. Another possibility is that lowering the groundwater under the landfill (resulting from groundwater extraction) may actually dislodge NAPLs and thus aggravate groundwater contamination problems" – U.S. Congress, Office of Technology Assessment

"For large contaminated aquifers, pumping and treating contaminated groundwater is less effective than previously believed. For large landfills, capping is an impermanent solution." – U.S. Congress, Office of Technology Assessment

USACE's application for this permit offers no information on the risk or risk reduction provide by the groundwater extraction & gradient system or any specific risk information or risk reduction objectives for any groundwater cleanup or ongoing off-site migration of contaminates. Nor does it say anything about the limits to or uncertainty of pumping from the bottom of the Calumet Aquifer in "perpetuity."

"Pumping from the Calumet aquifer to dewater specific sites is common in the study area." – U.S. Geological Survey

"Pumping lowers ground-water levels and creates a depression in the water table surrounding the pumpage. Ground-water gradients along most of the GCR/IHC usually are toward the river and canal (Fenelon and Watson, 1993, p. 25). If a depression in the water table because of pumpage extends outward from the pumping location to the GCR/IHC, a flow reversal can result and surface water can flow from the canal/river into the aquifer towards the pumping center." – U.S. Geological Survey

"Another small depression in the water table is shown to the north of the Lake George Branch (fig. 15). This depression explicitly is indicated on water-table maps for April 1989 (Fenelon and Watson, 1993), November 1990 (Greeman, 1995), and June 1992 (Kay and others, 1996), and is shown as an area of lowered water levels on water-table maps for other periods. This water-table depression was caused by pumping by an oil refinery as part of a remediation effort (Fenelon and Watson, 1993, p. 19)." – U.S. Geological Survey

"The Operational Treatment Plant will treat three influent flow sources (combined into one stream for treatment): sediment pore water, ECI site groundwater, and precipitation runoff. Groundwater is discharged into the East cell; the West cell receives only sediment pore water and precipitation. Water is also pumped between the two cells to balance the water levels in the CDF, so that all waters should be considered thoroughly mixed. As part of the ponded CDF operation, water will be held in the CDF for some time before and after dredging. The water quality of the ponds changes over time as it is held. Suspended solids settle out, ammonia degrades through the presence of naturally occurring bacteria, and organic compounds settle with the solids or are volatilized or biologically degraded." – USACE

"The estimated volume of water in the pond needing treatment is also expected to decrease from an annual 55 Mgal to an estimated 30 Mgal over the anticipated 4 to 5 month treatment season, due largely to increased evaporation from the pond." – USACE

MONITORING FOR LEAKS & EMISSIONS

Air monitoring stations should be deployed based upon historic Wind Rose data from month to month and real time monitoring should be based upon current metrological conditions at the time of monitoring.

Continuous state of the art monitoring utilizing Infrared, LIDAR, and Gas Chromatography devices should be deployed for air monitoring of as many known contaminates and their sources as possible…

"…LIDAR has shown that the concentration of the particulate matter content of clear air is highly variable and that such variations can indicate the structure and motion of the clear atmosphere. These capabilities have applications in atmospheric and meteorological research and various operational activities." – R. T. H. Collis

"A hydrocarbon layer has been intermittently encountered during groundwater monitoring activities since the beginning of the site investigations in 1991."

"There is no systemwide, continual monitoring program for Great Lakes CDFs. However, CDF water quality monitoring generally occurs during dredging and disposal operations and 12 CDFs do have monitoring wells in dike walls. The effectiveness of these monitoring wells has been questioned and may have limited value." – Steve Thorp, Great Lakes Commission

A Phase III Subsurface Characterization Report performed by Environmental Resources Management (ERM) revealed detectable concentrations of PCBs, pesticides, and volatiles in the site soils, groundwater and in the hydrocarbon layer."

"Two wells showed PCB concentrations greater than 50 ppm in the free-phase hydrocarbon layer." "These two locations are on the southern side of the site, within a few hundred feet of the canal, and approximately midway between the east and west boundaries." – Appendix I Design Documentation Report, USACE, 1999.

Reliance on Containment is Uncertain & Risky:

- Technologies selected as physical barriers (slurry wall and cap) are known to fail by U.S. EPA as stated by them in the Federal Register… And USACE has detailed construction deficiencies in the Containment Structures due to "deep obstructions" underground;

- Active containment via groundwater drawdown already experiencing pump failures and well capacity reductions due to CDF site conditions / lack of remedial and corrective actions before CDF construction;

- Emergency Action required due to entirely predictable "bathtub effect" after containment barriers installed caused failure of Sheet Steel Piling Wall along the Lake George Branch of the IHC was unforeseen by USACE;

- Containment located arbitrarily due to existing infrastructure and fails to encompass and contain known contaminated soils, plumes of groundwater contamination, and the "Free-Phase Hydrocarbon Layer" floating on top of groundwater up to 10 feet thick and migrating into the West (Lake George) Branch of the IHC

CONCLUSIONS

Don't Worry it's Under Control' – The USACE Two-Step: Or how the United States Army Corps of Engineers wants to make a Toxic Substance Control Act chemical dump out of a Confined Disposal Facility (CDF) that's within one-half mile of a high school, an elementary school, a city golf course, and a residential area in East Chicago, Indiana…

The goal should be unrestricted use for the CDF site not a 160 acre sacrifice zone in the middle of East Chicago, Indiana and the Marquette Plan area that is off-limits forever…

"Studies have been undertaken for all Canadian CDFs and the results indicate that plant and animal life that inhabit CDFs are bioaccumulating contaminants. Canadian researchers have suggested that waterfowl that inhabit or visit CDFs may be good biomonitors of bioaccumulation of sediment-associated contaminants." – Steve Thorp, Great Lakes Commission

"Plants grow quickly on dredged material inside CDFs and have provided an attractive habitat for some wildlife. Monitoring studies have shown that plants and animals that inhabit the CDFs may uptake contaminants from the dredged material. The degree of uptake varies with the organism, contaminant, and site conditions." – USACE

U.S. EPA and IDEM must require the USACE to dredge the IHC in its entirety to a clean bottom and to adequately treat any wastes generated from dredging to a level that eliminates risks to human health and the environment through the use of combinations of available innovative technologies. The USACE has a 42 year history of demonstrating that without being required to do so by U.S. EPA's and IDEM's such innovative treatment never will occur and permanent solutions will never take place.

U.S. EPA produced **Indian**a Harbor Site Proposed Sediment Clean-up Goals and granting this permit approval without requiring the USACE to dredge the IHC in its entirety to a clean bottom and to adequately treat any wastes generated from dredging to a level that eliminates risks to human health and the environment through the use of combinations of available innovative technologies that reduce the toxicity, mobility, or volume of toxic and/or hazardous dredged wastes will fail these cleanup goals.

USACE is the responsible party for deep contaminated sediments (up to 45% by volume in some locations) because of their dredging the IHC deeper by nearly twenty feet in some locations during World War II. The USACE's refusal to clean up the mess they precipitated by creating such a deep sediment trap in the first place is willful negligence in preventing full restoration of IHC and protecting the public and our environment. It also is a waste of taxpayers' dollars not to dredge the entire depth of the IHC of all contaminated sediments given the long-term risks, costs, and uncertainty...

Does it make any sense designate the entire expanded CDF capacity of 4,800,000 cubic yards of "heavily contaminated sediments" into a Toxic Substance Control Act toxic chemical land disposal facility when 200 thousand cubic yards capacity are requested by USACE?

Only if the next step is to also accept Hazardous Waste after Toxic Substance Control Act (TSCA) chemical waste landfill permitting – coincidentally there's that nagging issue of what to do with the "Presumptively Hazardous" sediments that need to be dredged from Indiana Harbor. Hmm...

We will witness the creation of a 160 acre toxic chemical dump next to two schools, a city park, and residences. What can you learn from that? Maybe that when you have government approving government the answer is bound to be yes! And likely another environmental liability to our communities long into the future.

The USACE is use to getting its way – it's the Army after all… I always thought that the United States Army was suppose to protect America not force another toxic disposal site with requirements for maintenance in "perpetuity" upon Northwest Indiana and the children of East Chicago, Indiana.

Emergency notifications need to include to local authorities, schools, residents, local businesses & workers not just U.S. EPA, IDEM and ECWMD…

Twelve years ago people questioned whether the East Chicago Waterway Management District had "either the expertise or the money to oversee the project properly, especially since the agencies' environmental impact statement didn't address "the fundamental question of who has responsibility for unfunded liabilities and third party claims" if anything should go terribly wrong." The USACE has provided conflicting answers and the question remains… So which is it?

This: "USACE has an existing project partnership agreement with the owner (the East Chicago Waterway Management District), and under this agreement USACE operates the site. The site operator is the USACE and USACE is the responsible party for the operation and maintenance of the site. Most operation and maintenance activities will be completed by independent parties under contract to USACE." – USACE

Or this: ""In 1989, the city of East Chicago became the owner of the ECI site as payment for back taxes owed by ECI. In assuming ownership without approved corrective and closure actions in place, the City of East Chicago also assumed the liability for the site. In 1994, the property was transferred to the East Chicago Waterway Management District (ECWMD), which serves as the local cost-share sponsor with USACE. In May 2005, the funding stream for CDF construction was converted to 100% federal, however ECWMD still maintains liability for cleanup of hazardous releases, including any TSCA sediment releases, under the existing Project Cooperation Agreement between USACE and ECWMD." – USACE

Twelve years ago Harold Henderson quoted local activist Betty Balanoff in his reporting on topic and she said: "To date there have been no real changes from the corps' original plan" "Only great community pressure persuaded them to research the project more thoroughly. Requests for any improvements are met with the excuse there is not enough money. There is no money to insure the project, to indemnify the community for property losses or for additional health problems, even though medical insurance here is at a minimum. We understand that the law mandates a cleanup of the ECI site and the dredging of the canal. But if there is not enough money to do it safely, more money must be found. The community cannot be expected to pay the difference in human life and damaged children."

Northwest Indiana and East Chicago, Indiana in particular have suffered more than their fair share of the burden of pollution and contamination of their communities.

The U.S. EPA and IDEM cannot continue to ignore the blatant environmental injustice of creating one of the largest toxic chemical land disposal units on the Great Lakes and the additional risks it will create…

"The cancer risk due to inhalation exposure to CDF emissions is estimated to be 2.3 x 10-6 (2.3 in 1,000,000). Based on air monitoring data, the total estimated cancer risk due to air toxics inhalation exposure from other sources in the area (i.e., without including CDF emissions) for 30 years is estimated to be 3.1 x 10-4 (3.1 in 10,000 or 310 in 1,000,000)."

"The corps and EPA conclude that a little more pollution can't hurt when things are already this bad. But a resident, or any reasonable person, might well conclude something very different--that simple fairness demands a "no net increase of pollution" rule for East Chicago--if a new CDF or industry will add to the existing pollution, then the EPA should at least bring about a matching decrease someplace in the area." – Harold Henderson

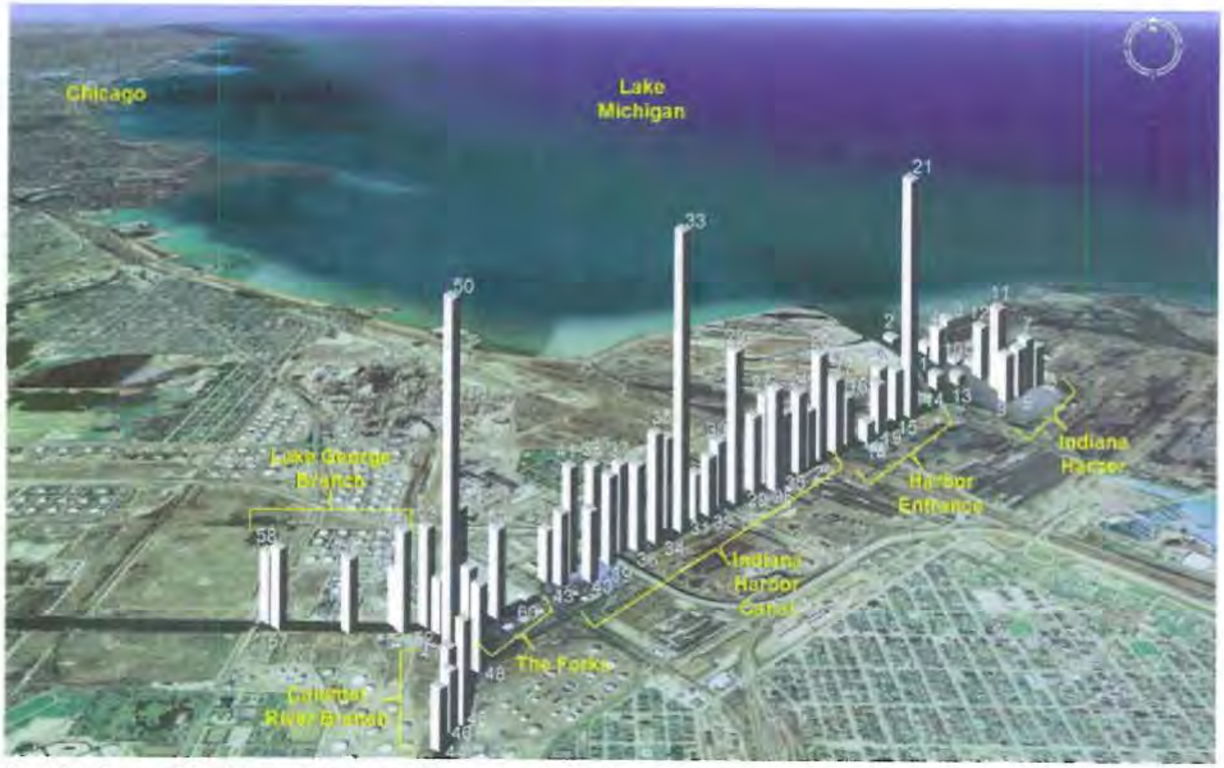

Illustration of IHC surface sediments PCB levels – contamination increases with depth.

Cleanup of RCRA Hazardous and TSCA Toxic chemical wastes must require preference to permanent solutions involving innovative treatment to eliminate their hazards & risks to human health and the environment and none are currently offered by USACE.

Indiana Harbor CDF was built on top of an active Superfund & Hazardous waste site;
Yes sir, the USACE is all about saving taxpayers' money…
But USACE Money is never enough to do the job right…
Not enough money to complete the RCRA Corrective Action at ECI;
Not enough money for removal of underground pipelines at ECI;
Not enough money for a liner or leachate collection system for the CDF;
Not enough money to hydraulic dredge IHC to clean depths;
Not enough money to separate and treat dredged wastes prior to disposal;
A shoestring CDF to TSCA toxic chemical dump sham forced upon Northwest Indiana…
But there's plenty of USACE money to grab & plop, slop & wash, slurry & pump, and hydraulically open dump toxic and hazardous dredged wastes in an unlined CDF within 1/2 mile of two schools, a city golf course, and residences for 30 years…

See Video at 2 minute, 30 second mark: [https://vimeo.com/70892379] 'Dredging Indiana Harbor'

"The Water Resources and Development Act of 2007 (WRDA 2007), Section 2005 amends Section 217 of WRDA 1996 regarding dredged material management. Important facets of this bill relating to CDF sustainability and beneficial use are as follows (USACE 2008b):

• Broadened definition of dredged material management measures--extends Federal participation in dredged material management facilities beyond disposal facilities and can include processing, treatment, and contaminant reduction.

• Non-Federal interests can perform acquisition, design, construct, manage, or operate a cost-shared dredged material processing, treatment, contaminant reduction, or disposal facility.

• Dredged material processing, treatment, contamination reduction, or disposal facilities may manage dredged material from multiple Federal projects in the region with combined cost-sharing among the multiple projects.

• The Corps of Engineers can pay the Federal share of dredged material disposal or placement capacity for Federal projects at dredged material processing, treatment, contaminant reduction, or disposal facilities.

• A non-Federal cost-sharing sponsor may receive credit for funds provided for dredged material processing, treatment, contaminant reduction, or disposal facilities.

• The Act does not change the Federal Standard to dredge in the most cost-effective way consistent with economic, engineering, and environmental criteria.

• If a dredged material processing, treatment, contaminant reduction, or disposal facility is not the Federal Standard, but beneficially uses dredged material for structural or nonstructural flood control, hurricane and storm damage reduction, or environmental protection and restoration, it can be considered for Federal participation under the beneficial use authorities of Section 204 of the WRDA 92, as amended by Section 207 of WRDA 97 and Section 2037 of WRDA 2007."

This raises the concern of other USACE projects or outside entities using the Indiana Harbor CDF and the continued lack of permanent solutions and innovative treatment technologies for reduction of the toxicity, mobility, or volume of dredged wastes...

The USACE Plan Is ultimately the most expensive possible relying the cheapest Short-Term cost option without adequate consideration of Long-Term Hazards and Costs...

The USACE has taken coercive public positions in seeking this Permit Approval by threatening not to Dredge the IHC if the Permit is not Approved and issued all the while emphasizing how much "heavily contaminated sediments" continue to disperse into Lake Michigan and hamper navigation on the IHC.

The permit approval would enable USACE to continue with open dumping land disposal of toxic and/or hazardous wastes utilizing methods and facilities that:

Lack a Permanent Remedy;

Do not reduce toxic dredged waste Volume;

Do not reduce dredged waste Toxicity;

Doe not reduce dredged waste Mobility;

Do not eliminate dredged waste Hazards & Risks;

Do not eliminate Human Exposures or Environmental Releases; and

Only has 65 years Monitoring but perpetual Maintenance & Costs...

There is an obvious and recognized need for the scale up and use of known & new innovative cleanup technologies for dredged wastes to achieve permanent solutions – where better fulfill such needs on an industrial scale than East Chicago, Indiana where industrial scale technologies have been developed for over a century and created these toxic and chemical wastes in the first place?

"The Environmental Protection Agency's (EPA's) risk analysis for potential air emissions from the proposed CDF says the facility could pose an increased lifetime cancer risk to an individual at the high school of two in a million. The analysis concludes that this additional risk is statistically irrelevant because the overall cancer risk from breathing the air in East Chicago is three in 10,000. That rationale leads to the following conclusion: The CDF could not be put in a wealthy residential community far from industry and heavy traffic because such a community would have a much lower background risk of cancer. The CDF would measurably increase the risk in that community. So the EPA is telling us the CDF would only be acceptable in a community that is already at high risk for cancer. The residents of such communities are typically lower income and often minorities, as is the case in East Chicago. Thus, the rationale behind the siting of this CDF is inherently unjust." – Bowden Quinn and Jennifer Gadzala, Grand Cal Task Force

"Government should have a policy of net risk reduction for any hazardous waste site it proposes to put in an at-risk community like East Chicago. Rather than tell the community the additional risk is negligible, it should prove to the community that it has reduced its overall risk through other actions to limit pollution." – Bowden Quinn and Jennifer Gadzala, Grand Cal Task Force

"The principle of environmental justice is that no community should have to accept an unfair burden of pollution. Yet that is exactly what is being asked of this community. The government wants the people who live around the proposed site or who go to school at East Chicago Central High School to accept a CDF that poses a small but perceptible increased risk of cancer and a potential threat to the value of their homes. All of us will be able to enjoy a cleaner Lake Michigan as a result. We believe the people who are being asked to accept the sediments deserve more in return for that sacrifice." – Bowden Quinn and Jennifer Gadzala, Grand Cal Task Force

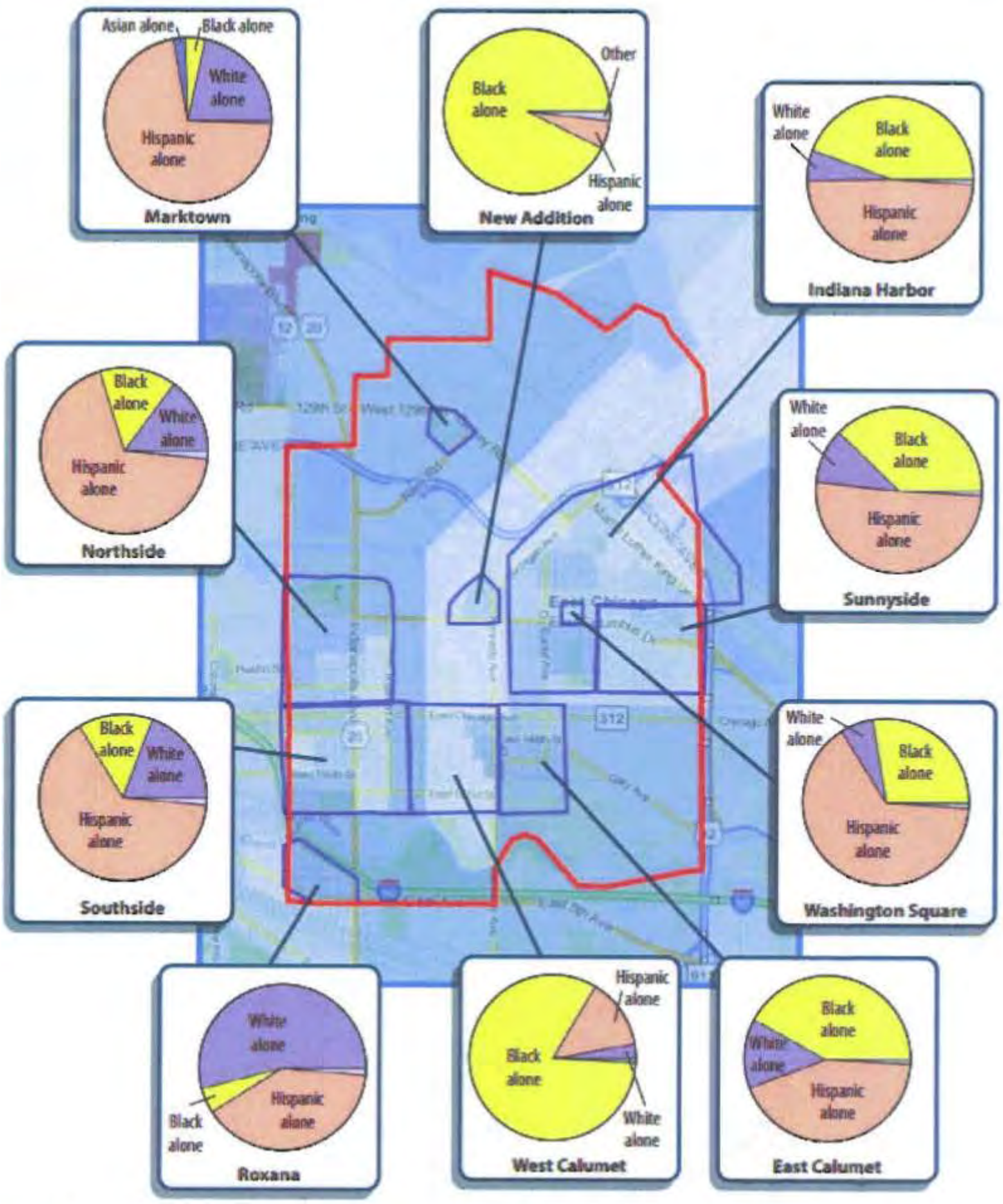

Figure 1 East Chicago Neighborhoods and Profile (source: city-data.com)

Community Engagement Plan 18

Demographics of Area surrounding the Indiana Harbor CDF…

The TSCA permit approval must be denied or modified to require a permanent solution using combinations of available innovative treatment technologies to reduce the toxicity, mobility, or volume of toxic chemical and/or hazardous dredging wastes and protect human health and our environment.

QUESTIONS

The PCB levels found in the IHC are comparable to other PCB contaminated sites in the U.S. like the Hudson River Superfund site with similar levels of PCBs requiring designation as Superfund Site and requiring the removal of contaminants from sediment. – Why is the IHSC not a Superfund Site?

So where is USACE's technology development program in the case of the Indiana Harbor CDF dump and pump TSCA chemical waste landfill permit?

Where are the public reviews the USACE committed to doing concerning technical dredging and disposal literature at least every five years and where has USACE "used all reasonable efforts" to take advantage of any advances in technologies?

Did the USACE switch to a ponded CDF because of difficulty in maintaining the proper inward groundwater gradient during dredging and dewatering operations?

How did unexpected difficulties presented by the characteristics of the dredged wastes themselves such as unexpected amounts of debris alter the planed handling procedures of the dredged wastes?

What are the effects of extracting groundwater from the bottom of the Calumet Aquifer?

Why are oil saturated and contaminated soils, free-phase hydrocarbons, PCBs above 50 ppm, Phenols at 750,000 ppm, etc and contaminated groundwater not being addressed or remedied at the ECI Site & CDF?

How is it possible for the U,S, EPA or IDEM to approve a risk-based permitting decision on this CDF that has Infinite open ended CDF maintenance in perpetuity? Does anyone actually think that will be the case? Because due to conflicting statements it still is not clear that USACE or ECWMD will ultimately be responsible for future liabilities...

"During the treatability testing, it was estimated that the concentrations of the dominant volatile components would be very near zero" – USACE

Is this because all or most of the VOCs will evaporate from the CDF?

Did USACE provide the required 2 foot inward groundwater gradient prior to operation of the CDF in 2012?

Has the required 2 foot inward groundwater gradient been maintained at all times since 2012?

If the ECWMD has liability for future costs, maintenance, and emergency response why are they, as the owner of the site, not included in this permit approval?

How does not having the owner of the site (ECWMD) included in this permit approval comply with laws and regulations pertaining to "Transfer of property" for the CDF?

TSCA now requires U.S. EPA to consider vulnerable populations, such as pregnant women and children – specifically how has this risk-based permit approval decision complied with the new TSCA requirements?

USACE justification for use of mechanical dredging is lower water content but subsequent slurry and pump with hydraulic open dumping operations defeats such justification by mixing dredged sediments with water pumped from the CDF to create a slurry not unlike that which hydraulic dredges create with sediments that are only 10-20% solids and result in an increase of 300-400% over the in-place sediment volume" how has U.S. EPA evaluated the hazards & risks associated with this significant change from USACE's original Plan?

How have the USACE changes from un-ponded to ponded operation impacted influent characteristics and volume or water to be treated?

How can U.S. RPA and IDEM approve this permit without any consideration of adding to the Risks of already living in the most industrialized city in the United States?

REFERENCES

See Video at 2 minute, 30 second mark: [https://vimeo.com/70892379] 'Dredging Indiana Harbor' Detroit Drone Aerial Video

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A Partial List of Studies Not Considered in the Development of this Statement of Basis for the DuPont Site...

Pg 125 Table 57 Waste Fills of greatest Concern Site No. 17B DuPont – 0.1 miles to River Bank

Pg 127 Table 59 Embryo-Larval Survival / Teratogenicity Test Results on Discharges – indicates 0 Survival @ 100% and 66% Teratigenicity (Causes Birth Defects) for DuPont's discharges to the Grand Calumet River…

Pg 128 Table 60 Showes Chemistry Data from Toxicity – Teratogenicity Tests for DuPont 003 Discharge – indicates elevated concentration of Strontium (Sr), Zinc (Zn), and Sodium (Na)…

Pg 180 DuPont Discharge Flow = 4.8 mgd October 1984

Documents Received at the East Chicago Listening Session

NAME	DATE	Comments
Prepared/Completed by: Morgan Collier	6/26/2020	
Reviewed by: Bakari Baker	6/30/20	**[X]**: I reviewed this WP and found it satisfactory. (No comments were provided.) **[ ]**: I reviewed this WP and found it satisfactory. I also included **comments in a dark red colored font**. **[ ]**: All comments have been resolved.
Edited by:		

Purpose: To summarize multiple documents provided by attendees to the OIG at the East Chicago, Indiana USS Lead Superfund Site OIG listening session, as it relates to risk communication at the site.

Project Guide Step # : 44b

Source(s):

#	Description/Title	Source Document
1	DuPont Facility Disposal	Link: **Source 1.pdf**
2	Failures to Regulate	Link: **Source 2.pdf**
3	Pathway Exposures/Questions for EPA	Link: **Source 3.pdf**
4	Pathway Exposures/Questions Addressed to CIC	Link: **Source 4.pdf**
5	Questions Addressed to EPA Site Team	Link: **Source 5.pdf**
6	Response to Proposed ROD and List of Community Involvement Activities	Link: **Source 6.pdf**
7	List of concerns after EPA Public Meeting	Link: **Source 7.pdf**
8	Concerns Addressed to Albert Kelly	Link: **Source 8.pdf**
9	Information Packet	Link: **Source 9.pdf**
10	Summary of Concerns	Link: **Source 10.pdf**
11	Concerns Addressed to Lovingood and Trynosky	Link: **Source 11.pdf**
12	Concerns on PCB's and CDF	Link: **Source 12.pdf**
13	Concerns Addressed to EPA about Unresponsiveness/Health Concerns	Link: **Source 13.pdf**
14	Concerns Continued from Source 12	Link: **Source 14.pdf**

Scope: The details section gives an overview of the key points from the multiple documents received, as it relates to risk communication and the USS Lead Superfund site.

Conclusion(s):

1.) **Concerns were voiced about:**
   a. The conceptual site model (See Details source 3, List #2)
   b. EPA's ability/credibility to protect human health (See Details source 5, List #1d)
   c. ROD didn't evaluate multiple exposures and chronic exposures within and adjacent to the Superfund site (See Details source 5, List #2d)
   d. Incomplete and/or inconsistent time-consistent time-critical soil removal actions (See Details source 7, List #2)
   e. Concerns that a portion of the site was forced to evacuate and others were told to remain behind at the site (See Details source 8, List #5)
   f. Century of toxic pollution in soil, household dust, and groundwater resulting in generations of people suffering adverse health effects (See Details source 9, List #6)
   g. IDEM and US EPA have known about public health threats since 1985 (See Details source 11, List #4)
   h. Long-term health effects (See Details source 11, List #5)
   i. Concern that the CDF operation did not consider hazards and risk to human (See Details source 12, List #6)
   j. A concerned citizen writes a letter dated March 6, 2018, that EPA has not responded to their previous comments and questions since September of the previous year (See Details source 13, List #1a)
   k. Limited information provided on the cumulative effects from multiple pollutants and on specific pollutants (See Details source 13, List #2a-f)
   l. Concern was voiced that a dump is being created within one-half mile of schools, golf course, and residential area of East Chicago and that there were environmental justice/environmental burden concerns for the surrounding community (See Details source 14, List #5-7).

2.) **Questions**:
   a. Why the zones were split up (See Details source 3, List #4)
   b. How much contamination is going to be left behind in the community, tenants versus owners, historical versus current trends, and EPA's plan to prevent the next generation from being impacted by the remaining contamination (See Details, source 3, List #6)

3.) The concerned citizen lists several community involvement activities provided by EPA to the community (See Details source 6, List 4a-p).

<u>Details</u>:

<u>Source 1:</u>

1.) The concerned citizen discusses the waste disposal at the DuPont RCRA Facility and states that the facility has a multitude of hazardous waste disposal sites and doesn't belong near a neighborhood [page 2, last paragraph].

<u>Source 2-</u>

1.) The concerned citizen states that DowDuPont-Chemours, USS Lead, and other PRP's have contaminated Air, Land, and Water of East Chicago and Northwest Indiana have failed to be regulated under federal, state, and/or local laws and regulations (page 1, paragraph 1).
2.) Auditor's note, risk communication topic/criteria was not identified in this source document.

<u>Source 3-</u>

1.) The concerned citizen states that the groundwater migration pathway and soil exposure pathway and drinking water threat and human food chain threat of the surface water pathway were not scored as part of the HRS evaluation (page 1, paragraph 4, 1st sentence).
2.) The concerned citizen states that EPA failed to comprehensively investigate all exposure pathways and determine the full extent if contaminated lead to a flawed conceptual site model based only on aerial deposition and surface water migration (page 2, paragraph 6).
3.) The concerned citizen states that EPA ignored probably sources of potential contamination from fill historically used and groundwater contamination in the Calumet Sand Aquifer (page 2, paragraphs 7-8).
4.) In 2014, US EPA stated that OU1 was subdivided into zones but provided no rational explanation of why it had to be subdivided, according to the document submitter. In addition, the document submitter highlights that zone 2 was left out of the consent decree and was not included in the ESD (page 4, paragraph 2).
5.) The concerned citizen expressed concerns about the contaminated soil mixing with sand and stated that it will not change the total amount of toxic metals (page 5, paragraph 1).
6.) Several questions were posed by the concerned citizen to the U.S. EPA, regarding how much contamination is going to be left behind in the community, tenants versus owners, historical/current trends, and EPA's plan to prevent the next generation from being impacted by the remaining contamination (page 6, question list).
7.) The concerned citizen suggested the EPA to comprehensively investigation the site from all sources of contamination and reevaluate significant differences for longer term health (page 6, last paragraph).

<u>Source 4:</u>

1.) Same document provided as Source 3. This document had a header on the first page addressed to Janet Pope, Community Involvement Coordinator, of the USS Lead Superfund Site.

Source 5

1.) The document submitter addressed the first email to Janet Pope (CIC) and Thomas Alcamo (RPM) regarding comments about the proposed record of decision. Below are opinions submitted by the author of that document: (page 1, paragraph 1).
    a. Cancer risk in East Chicago, Indiana is 310 in 1,000,000 (page 1, paragraph 1).
    b. States that toxic crime took place at WCHC for 44 years (page 1, paragraph 6).
    c. For 20 years there has been a consistent pattern of elevated blood levels in children (page 1, paragraph 7).
    d. Concern about EPA's credibility and ability to protect people's health and the environment (page 5, paragraph 4).
2.) The document submitter addressed the second email to Janet Pope (CIC), Thomas Alcamo (RPM), and Bruno Pigott (IDEM), and the comments were similar to those outlined above. Below are opinions submitted by the author of that document:
    a. Questions were raised related to the division of the zones and the blood leads levels in the area (page 7).
    b. Concerned citizen stated that a full investigation still had not been completed three decades later (page 8, paragraph 1).
    c. Mentioned that a November 2018 Factsheet on Proposed Cleanup Plan for Residential Area Zone 1 EPA talked about how the demolition of WCHC removed barriers to resident's exposure. The submitter did not understand then how the risk to human health was not changed (page 15, paragraph 6-7).
    d. Concerned citizen stated that the ROD failed to evaluate public health risks to multiple and chronic exposures within and adjacent to the Superfund site (page 15, paragraph 8).

Source 6:

1.) This email was addressed to Janet Pope (CIC) and Thomas Alcamo (RPM) regarding the proposed ROD). The document submitter highlighted the significant differences between this sites and others sites, to include: community engagement→ public health screening, public health education, and environmental monitoring funded by US EPA (page 2, paragraph 4).
2.) The concerned citizen also discussed the EPA's site conceptual models and stated that EPA dismissed concerns of toxic soil contamination from solid wastes historically used as fill material (page 3, paragraph 1).
3.) The concerned citizen notes that when EPA is made aware of the impacts of elevate blood levels, they focus on removal actions and alternative drinking water supplies (page 4, paragraph 6).
4.) The concerned citizen lists several community involvement activities provided by EPA:
    a. Health information-22,000 copies-community newsletter devoted to lead awareness, health education, lead poisoning program

b. Lead awareness education seminars at local hospitals
c. Lead education materials to schools, daycare centers, and Parents As Teacher Association
d. Development and publication of site specific lead awareness and health education coloring book
e. Develop lead poisoning awareness curriculum-local school district
f. Extensive and yearly blood lead screening and follow-up and door to door screening and distribution of educational materials
g. Off-site blood lead screening activities at local community events
h. Contacts local pediatricians, provide lead awareness and health educational information packets to encourage blood lead screening (List up to Page 5)
i. Permanent EPA field office
j. Informational booths at local fairs, malls, schools, hospitals
k. Develop lead poisoning prevention merit badge for local Girl Scouts chapter
l. Indoor lead exposure evaluation programs
m. Contamination exposure prevention information programs and specials projects
n. Distribute of HEPA vacuum cleaners
o. Soil and/or drinking water testing programs
p. Health ordinances requiring soil testing/remediation of soils exceeding risk-based cleanup standards in new residential construction (List up to Page 6)

Source 7

1.) The concerned citizen states that it is a follow-up to EPA's September 16, 2017 Public Meeting.
2.) The concerned citizen states that residents are experiencing incomplete and/or inconsistent time-consistent time-critical soil removal actions (page 1, first section, #4).
3.) The concerned citizen expresses concerns that US EPA, IDEM, and the City of East Chicago have allowed land disposal of hazardous wastes for decades and still today (page 10, halfway down page, #1).
4.) The concerned citizen expressed their opinion that EPA and IDEM aren't completely detoxifying soils and groundwater (page 11, #4).
5.) The concerned citizen expressed their opinion that the local industry and Army Corps of Engineers make the decisions at the site (page 11, #5).

Source 8

1.) This email sent on July 27, 2017 from concerned citizen(b) (6) [redacted], and was addressed to Albert Kelly, Senior Advisor to the EPA Administrator, regarding the July 15, 2017 EPA public meeting.
2.) The concerned citizen of the email stated that Superfund is failing to protect people, and highlighted East Chicago (page 1, paragraph 1).
3.) The concerned citizen states that the State discovered lead contamination in 1985 "as high as 594,420 mg Pb/g (ppm)" (page 2, paragraph 2).

4.) The concerned citizen states that the WCHC had lead in soil and inside homes that had test results at 92,000 ppm and 32,000 ppm, and that groundwater test were 16,000 ppm (page 2, paragraph 8).
5.) The concerned citizen states concerns that a portion of the site was forced to evacuate and others were told to remain behind at the site. In addition, the author states that residents were told it was safe to remain during demolition and emergency removal actions, given false impressions of permanent cleanup and restoration of properties (page 4, List #5 and #6).
6.) The concerned citizen of the email states that these toxic sediments have been described as "among the most contaminated and toxic that have ever been reported" (page 7, paragraph 4).
7.) The concerned citizen expressed concerns about the IHC sediments (page 7, paragraph 9).

Source 9

1.) This packet of information is from concerned citizen (b) (6) [redacted] (see bottom of page 1).
2.) Five years ago CDC said it believed children living in a Superfund site in East Chicago were "no longer exposed to lead from any source". Reuters analysis of state blood testing found between 2005-2015, 22% of children tested in a residential area of the site had elevated lead levels (page 1, paragraph 1).
3.) Region 5 EJ Analysis of USS Lead Site. US EPA EJ Case criteria for state of Indiana- minortiy-28% or greater, low income-58% or greater. For the USS Lead Site within a 1-mile radius with a population of 8,933, minority-92%, low income-59% (page 5).
4.) Conceptual-site model showing air emissions, groundwater flow, and other factors (page 8).
5.) Slides describing RI/FS of site, mentions aerial deposition of lead, former Anaconda operations at the housing area, contamination isolation to fill layer, 47% of yards require remediation (page 9).
6.) States that there has been a century of toxic pollution in soil, household dust, and groundwater resulting in generations of people suffering adverse health effects (page 12).
7.) DuPont site is 210 feet from the USS Lead Superfund Site Zone 3 (page 18).
8.) DuPont site is 365 feet from the USS Lead Superfund Site Zone 2 (page 19).
9.) Over 100,000 people live within 4 miles of the DuPont and USS Lead Sites (page 21).
10.) States that the Calumet region's geology is not stable for toxic and hazardous waste disposal and that dumps/fill sites have proliferated throughout Northwest Indiana (page 28).

Source 10

1.) Letter on January 2019, summarized the January 14, 2019 written comments to US EPA: that the most protective/lowest long term cost cleanup would be the one that eliminates health threats and financial liabilities to PRPs and contaminated communities, or Remedial Action Alternative 4D (page 1).

2.) East Chicago Drinking Water Overview: before excavation 42% of homes had lead levels in tap water that exceeded 15ppb according to US EPA January 28, 2017 study (page 2, paragraph 4).
    a. At the August 19, 2017 Region 5 Presentation, it was stated that lead is not coming from the water source (page 2, paragraph 5-6).
    b. Northwest Indiana reports that the city began using a chemical to control corrosion of lead pipes approved by IDEM but not recommended by experts, as it could increase lead release (page 2, paragraph 8; page 3, paragraph 1)
3.) States that the DuPont Facility never had a Part B Final RCRA permit (page 3, paragraph 9).
    a. States that the landfills (dumps) do not have leachate or vapor collection systems and most completely lack liners or caps (page 4, paragraph 5).

Source 11:

1.) Letter from concerned citizen(b) (6) [redacted] to Christina Lovingood and Jill Trynosky, dated June 26, 2019 (page 1).
2.) Citizen states that the WCHC was located upon known contaminated land and that there are environmental justice concerns (page 1, paragraph 1).
3.) Citizen states that US EPA is inadequately communicating human health risks and have failed to protect human health (page 1, paragraph 2).
4.) Citizen states that IDEM and US EPA have known about public health threats since 1985 (page 1, paragraph 3).
5.) Citizen states that generations have suffered from toxins and have a range of effects ranging from birth defects, learning disorders, to chronic effects such as cancer and autoimmune diseases (page 1, paragraph 4).
6.) Citizen states that the Calumet community is impacted by contaminated groundwater entering their homes basements (page 2, paragraph 3).
7.) Citizen states that EPA failed to eliminate environmental and human health threats by (page 4, paragraph 3):
    a. Leaving toxic wastes and contaminated groundwater in place
    b. Spreading toxic contamination to another community
    c. Not achieving a permanent solution using alternative treatment technologies
    d. Ruling out other known metal contaminates such as Polynuclear Aromatic Hydrocarbons, Furans, and Dioxin
    e. Using biased calculations to establish health risk and cleanup levels (page 7, paragraph 1)
8.) Amereco Engineering did an assessment for WCHC in February 15, 2017 and found that lead and arsenic were in exceedance in concentrations as high as 45,000 mg/Kg and 5,200 mg/Kg (pg.6, paragraph 4).

Source 12

1.) Letter addressed to Christopher Drew (U.S. Army Corps of Engineers), Mike Nguyen (U.S. Army Corps of Engineers), Dr. Jennifer Miller (U.S. Army Corps of Engineers), Robert Kaplan (Acting Region 5 Administrator), Margaret Guerriero (Director of Land

and Chemical Division), Jean Greensley (Project Manager, US EPA Region 5), Bruno Pigott (Commissioner IDEM), and George Ritchotte (Project Manager, IDEM) (pages 1-2).

2.) Letter is in regards for the approval for PCB risk-based disposal of sediment containing polychlorinated biphenyls (PCBs) in the Indiana Harbor and Canal Dredging Project (page 2, top of page).
3.) Voices concerns that the USACE's plan does not fully address known threats to the community of East Chicago, as it only removes 55% of the toxic contamination in some areas (page 5, paragraph 4).
4.) Concerned that the approval is based upon a flawed assumption/model of risks to human health and impacts to the community (page 5, paragraph 3).
5.) Concerns that the CDF Land Disposal site was not investigated, assessed, or remediated prior to its use (page 7, paragraph 3).
6.) Concerns that the CDF operation did not consider hazards and risk to human health (page 14, paragraph 3).
7.) Dioxin levels occurring from CDF are much lower than national averages so estimated dioxin pollution released from CDF is not expected to increase health risks (pg. 32, paragraph 4).
8.) Mentions that the groundwater gradient system will prevent contaminant migration to the Calumet Aquifer and to the Lake George Branch (page 42, paragraph 3).

Source 13-

1.) Response on the DuPont Site-Dated March 6, 2018 by (b) (6) [redacted] (Top of page 1 and bottom of page 3).
    a. The concerned citizen writes that EPA has not responded to their previous comments and questions and mentions they have had since September of last year (2017) to formulate responses (page 1, paragraph 1).
    b. The citizen mentions that there are some species of Sulfate that exist at the DuPont site and could be involved in the proposal and that each has requirements to operate optimally. They are concerned about the protocol being used and are requesting a copy of it (page 1, paragraph 2, sentences 1-3, last sentence).
    c. The concerned citizen questions the claim that the natural area on the DuPont site is a pristine unaffected ecological area (page 2, paragraph 2, sentence 1).
2.) Points for January 10, EPA Meeting on Status of DuPont Superfund Site in East Chicago by (b) (6) [redacted] (Top of page 4).
    a. The concerned citizen states that the idea of detoxifying materials and changing them to make them insoluble is confusing to the citizens of East Chicago (page 5, number 4 on list).
    b. States that cumulative effects of arsenic have not been addressed by EPA and other agencies, and also mentions effects from multiple pollutants not just arsenic (page 5, number 7b on list).
    c. States that cadmium is ignored [by EPA and other agencies it is inferred] (page 5, number 7c on list).

d. Citizen states that no information is provided about chromium [by EPA and other agencies it is inferred] (page 6, number 7e on list).
e. The concerned citizen has concerns and questions about fluoride (page 6, number 7g on list)
f. The concerned citizen questions why nickel is in water samples if there are no known natural deposits in the area (page 6, number 7k on list).
g. The concerned citizen mentioned that the levels in the HHRA were 10-100 times lower than reports from 1998, and questions why, as EPA and IDEM had them available for at least 19 years (page 9, last paragraph).

3.) Questions for the January 20 EPA Meeting in East Chicago by (b) (6) [redacted]
   a. Concerns voiced about not informing residents about the Calumet Aquifer having a remission of pollution exposure of 1-5 years (page 1, paragraph 1).
   b. Concerns about the population (approximately 16.5%) will be susceptible to serious effects from pollution (page 1, paragraph 2).
   c. Concerns about the long term effect of the Calumet Aquifer and precipitation (page 1, paragraph 4).
   d. Concerns about the protocol for removing and replacing soil at properties (page 1, paragraph 5).

Source 14

1.) Continuation of Source 12.
2.) Excerpts from different sources regarding the Calumet Aquifer are provided throughout the document.
3.) Concerns were stated about risk and risk reduction for groundwater cleanup and off-site migration of contaminates (page 5, paragraph 3).
4.) It was expressed by the concerned citizen that air monitoring should be deployed of contaminates and their sources (page 6, paragraph 3-4).
5.) Concern was voiced that a dump is being created within one-half mile of schools, golf course, and residential area of East Chicago (page 7, paragraph 6).
6.) Concern was voiced that Northwest Indiana and East Chicago have suffered the burden of pollution and contamination in their communities, and the concerned citizen states EPA and IDEM cannot ignore environmental injustice of creating one of the largest toxic chemical land disposal units on the Great Lakes and the additional risks it will create (page 10, paragraph 2-3).
7.) Several excerpts also speak on the risk analysis from the air emissions from the proposed CDF and the environmental burden of the pollution in the area that this would bring to the surrounding community (page 13, last paragraph; page 14).